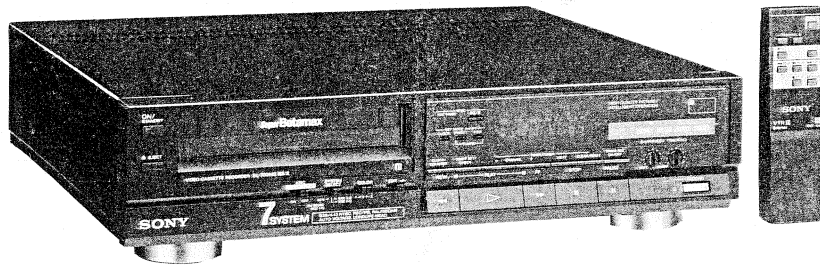


SL-700ME

RMT-158

SERVICE MANUAL

ME Model



Super Betamax

711 B3 CHASSIS

SPECIFICATIONS

System

Video recording system	Rotary two-head helical scanning
Video signal	CCIR standards, PAL and SECAM color
Channel coverage	EIA standard NTSC _{3.58} NTSC _{4.43} color PAL B, G, SECAM B, G NTSC M
RF output signal	Western European channels UHF channels 30 to 39 (variable) American channels UHF channels A26 to A38 (variable) 75 ohms, unbalanced
Antenna	75 ohms, asymmetrical antenna socket

Video

Input	LINE IN VIDEO: phono jack 1.0 V (p-p), 75 ohms, unbalanced, sync negative
Output	LINE OUT VIDEO: phono jack 1.0 V (p-p), 75 ohms, unbalanced, sync negative

Audio

Input	LINE IN AUDIO: phono jack More than 47 kilohms, -10 dBs (0 dBs = 0.775 Vrms)
Output	LINE OUT AUDIO: phono jack Less than 10 kilohms, -10 dBs (47 kilohms load), unbalanced

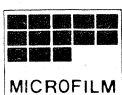
Tape transport (PAL and SECAM)

Tape speed	18.73 mm/sec.
Maximum recording time	2 hours 10 min. (with Sony L-500 cassette) 3 hours 15 min. (with L-750)
Fast-forward/rewind time	Under 4 min. (with L-500)

— Continued on next page —

• SERVICE OF REMOTE COMMANDER RMT-158

Remote commander RMT-158 is available as a unit. But as individual parts the battery case lid of commander is only available.



Beta
B VIDEO CASSETTE RECORDER
SONY®

Tape transport (NTSC_{3.58} and NTSC_{4.43})

Tape speed	ⒻⒾ : 20 mm/sec. ⒻⒿ : 13.3 mm/sec.
Maximum recording time	ⒻⒾ : 3 hours 20 min. ⒻⒿ : 5 hours (with Sony L-830 cassette)
Fast forward/rewind time	Under 4 min. (L-500)

Timer

Clock	Quartz locked
Time indication	24-hour cycle
Timer setting	Only for recording 1 event/7 days or every day

General

Power requirements	110 – 240 V AC $\pm$ 10% 50/60 Hz $\pm$ 0.5%
Power consumption	27 W
Operating temperature	5°C to 40°C (41°F to 104°F)
Storage temperature	– 20°C to + 60°C (– 4°F to + 140°F)
Dimensions	Approx. 430 × 110 × 368 mm (w/h/d) (17 × 4 ³ / ₈ × 14 ¹ / ₂ inches) incl. projecting parts and controls
Weight	Approx. 6.3 kg (13 lb 14 oz)

Remote Commander RMT-158

Remote control system	Infrared control
Command mode	VTR-1
Power requirements	3 V DC, two R6 batteries (size AA)
Dimensions	Approx. 45 × 18 × 150 mm (w/h/d) (1 ¹³ / ₁₆ × 2 ³ / ₃₂ × 6 inches) including projecting parts and controls
Weight	Approx. 90 g (3.2 oz) with batteries

Accessories supplied

Remote Commander RMT-158 with two R6 batteries (1)
75-ohm coaxial cable for recorder to TV connection (1)
Screwdriver for RF channel adjustment (1)
AC plug adaptor (1)
Antenna connector (2)

Optional accessories

Betamax video cassette tape
Video head cleaning cassette L-25CL

SAFETY CHECK-OUT

After correcting the original service problem, perform the following safety checks before releasing the set to the customer:

1. Check the area of your repair for unsoldered or poorly-soldered connections. Check the entire board surface for solder splashes and bridges.
2. Check the interboard wiring to ensure that no wires are "pinched" or contact high-wattage resistors.
3. Look for unauthorized replacement parts, particularly transistors, that were installed during a previous repair. Point them out to the customer and recommend their replacement.
4. Look for parts which, though functioning, show obvious signs of deterioration. Point them out to the customer and recommend their replacement.
5. Check the B+ voltage to see it is at the values specified.

SAFETY-RELATED COMPONENT WARNING!!

COMPONENTS IDENTIFIED BY MARK **A** OR DOTTED-LINE WITH MARK **A** ON THE SCHEMATIC DIAGRAMS, EXPLODED VIEWS AND IN THE PARTS LIST ARE CRITICAL TO SAFE OPERATION. REPLACE THESE COMPONENTS WITH SONY PARTS WHOSE PART NUMBERS APPEAR AS SHOWN IN THIS MANUAL OR IN SUPPLEMENTS PUBLISHED BY SONY. CIRCUIT ADJUSTMENTS THAT ARE CRITICAL TO SAFE OPERATION ARE IDENTIFIED IN THIS MANUAL. FOLLOW THESE PROCEDURES WHENEVER CRITICAL COMPONENTS ARE REPLACED OR IMPROPER OPERATION IS SUSPECTED.

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SECTION 1 GENERAL

WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.

Precautions

On safety

- This unit operates on 110 — 240 V AC, 50/60 Hz. No voltage adjustment is necessary.
- Should any solid object or liquid fall into the cabinet, unplug the unit and have it checked by qualified personnel before operating it any further.
- Unplug the unit from the wall outlet if it is not to be used for an extended period of time. To disconnect the cord, pull it out by the plug. Never pull the cord itself.
- The unit is not disconnected from the AC power source as long as it is connected to the wall outlet, even if the unit itself has been turned off.

On installation

- Allow adequate air circulation to prevent internal heat build-up. Do not place the unit on surfaces (rugs, blankets, etc.) or near materials (curtains, draperies) that may block the ventilation slots.
- Do not install the unit near heat sources such as radiators or air ducts or in a place subject to direct sunlight, excessive dust, mechanical vibration or shock.
- The unit is designed for operation in a horizontal position. Do not install it in an inclined position.
- Keep the unit and cassette tapes away from equipment with strong magnets, as for example a microwave oven or a large loudspeaker.
- Do not place any heavy object on the unit.
- Do not install the unit near an AM receiver, since a noise may be heard when listening to the AM program.
- This unit should not be operated for two hours after being transported from cold to a hot environment to avoid condensation from forming on the head drum. Condensation can cause the tape to stick to the head drum, resulting in damage to the tape.

On operation

- When the unit is not in use, turn the power off to conserve energy and to extend its useful life.
- Remove and store video cassettes after recording or playback.
- Store the cassettes in their cases and keep them in an upright position to prevent intrusion of dust and uneven winding.

On cleaning

Clean the cabinet, panel and controls with a dry soft cloth, or a soft cloth lightly moistened with a mild detergent solution. Do not use any type of solvent, such as alcohol or benzene, which might damage the finish.

On repacking

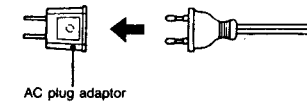
Do not throw away the carton and packing materials. They make an ideal container in which to transport the unit. When shipping the unit to another location, repack it as illustrated on the carton.

If you have any questions about this unit, contact your Sony service facility.

This section is extracted from instruction manual.

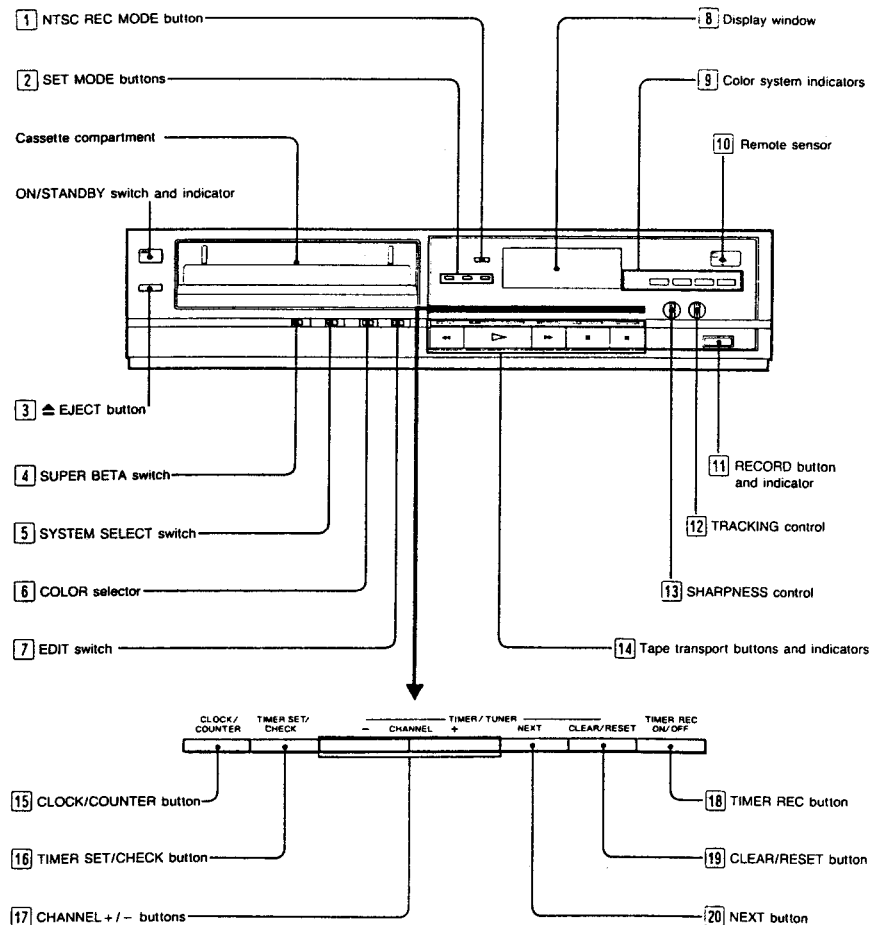
This unit is designed to receive programs based on the PAL, SECAM and NTSC₃₅₈ color systems and to record and play back in these systems, plus NTSC₄₃.
• Tapes recorded with the French SECAM color system can be played back on this unit but it is not possible to receive French TV broadcasts with this unit.

Use of the supplied AC plug adaptor
If the plug does not fit into the wall outlet, use the supplied AC plug adaptor.



Location and Function of Controls

Front



For details on the use of each control, refer to the pages indicated in the ●.

1 NTSC REC MODE button (effective only for NTSC) ●
Select the recording speed **FB II** or **FB III**. **FB II** or **FB III** indicator in the display window will light up. In the playback mode, the **FB II** or **FB III** mode is automatically selected.

2 SET MODE buttons
CLOCK: Press to start the setting of the current time.
PRESET: Press to start the presetting of TV channels.
FINE: Press to start the fine-tuning of a TV station. Press the same button again to cancel the setting mode.

3 EJECT button
Press this button to eject the cassette.

4 SUPER BETA switch
Normally this selector is set to OFF.
When the video signal system is NTSC, to record or play back in Super Beta, set this selector to ON.

5 SYSTEM SELECT switch
This switch can select both TV standard and the color system. Set this switch according to the TV standard on which your TV receiver is based.

Color system	PAL	SECAM	NTSC4.43	NTSC3.58
TV standard	B, G	B, G	*	M
Recording from TV receiver	PAL/SECAM/NTSC4.43 AUTO	PAL/SECAM/NTSC4.43 AUTO		NTSC3.58
Play back	PAL/SECAM/NTSC4.43 AUTO	PAL/SECAM/NTSC4.43 AUTO	PAL/SECAM/NTSC4.43 AUTO	NTSC3.58
Recording from other video cassette recorder	PAL/SECAM/NTSC4.43 AUTO	PAL/SECAM/NTSC4.43 AUTO	** NTSC4.43	** NTSC3.58

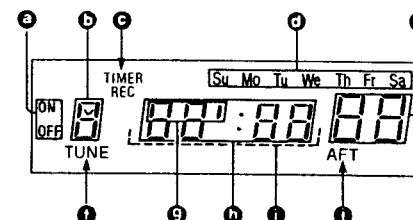
* This unit can not receive programs based on NTSC4.43.

** When the unit is set to NTSC3.58 or NTSC4.43 manually, the associated indicator will light up.
If the signal has been improperly recorded so that the picture is disturbed.

6 COLOR selector ●
Adjust the color intensity of the playback picture. It is effective only when the video signal system is PAL and NTSC not SECAM.

7 EDIT switch ●
Normally set this switch to the left position. When editing a tape onto another recorder, set to the right position to improve the edited picture quality.

8 Display window



9 Timer turn-on and turn-off setting indicators

10 Tuning band indicator

11 TIMER REC (timer recording) indicator

12 Day-of-the-week indicators

13 Channel number

14 TUNE indicator

15 Tuning indicator

16 Clock, timer turn-on time or timer turn-off time

17 Tape counter

18 AFT (Automatic Fine Tuning) indicator

19 Color system indicators

Show the color system of a TV program being received or a tape being played back.

20 Remote sensor

Detects the signals transmitted from the Remote Commander.

21 RECORD button and indicator

Press this button to start recording.

22 TRACKING control ●

Adjust this control to obtain the best possible picture if streaks or snow appears during playback.

23 SHARPNESS control ●

Adjust the sharpness of the picture if necessary.

24 Tape transport buttons and indicators

◀ REW (rewind), ▶ PLAY (playback), ▶▶ FF (fast forward), ■ STOP, || PAUSE

25 CLOCK/COUNTER button

Press this button to select the clock display or the tape counter display.

26 TIMER SET/CHECK button

Press to start the setting or checking of the timer channel.

27 CHANNEL +/- buttons ●, ●, ●

Press to select the channels, to set the clock or timer, or to preset TV stations.

28 TIMER REC button ●

Press to activate the timer recording.

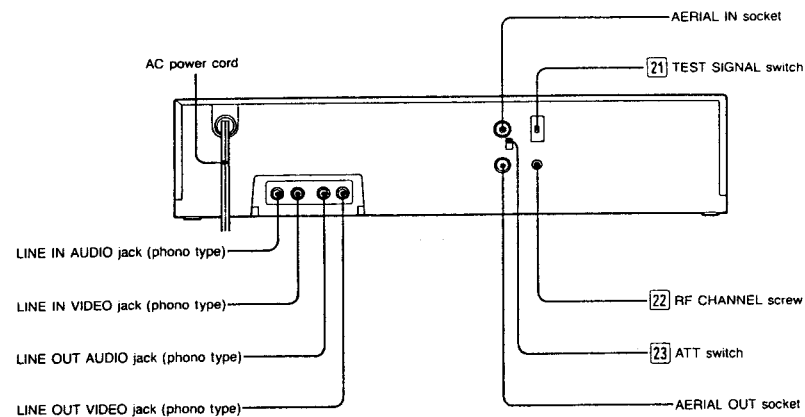
29 CLEAR/RESET button

Press this button to reset the tape counter to "0000" and also to clear the timer setting or an unused channel number.

30 NEXT button ●, ●

Press to advance to the next item to be set during clock setting, timer setting or channel presetting.

Rear



21 TEST SIGNAL switch

Set to ON to obtain in the test pattern for adjusting the TV so that it can receive the signal from the recorder.

22 RF CHANNEL screw

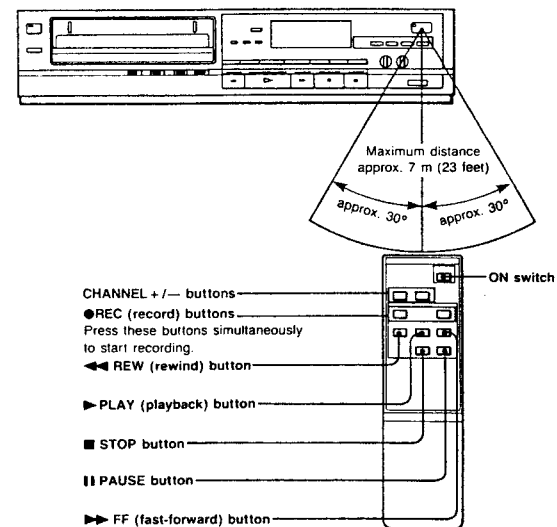
If there is interference on the factory-preset channel for RF output and the signal of this recorder cannot be displayed clearly on the TV screen, adjust this screw with the supplied screwdriver.

23 ATT switch

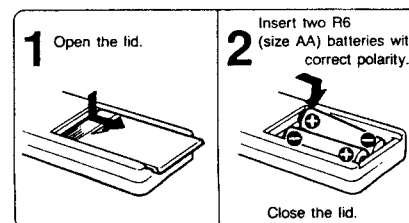
Normally set this switch to DX. If the TV signal is very strong, set the switch to LOCAL.

Remote Commander RMT-158

The buttons on the Commander without any explanation will function the same as the buttons on the recorder with the similar name or mark.



Battery Insertion



Battery life

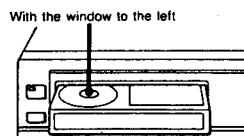
In normal operation, batteries will last for about six months. If the operating range of the Remote Commander becomes noticeably short, replace the batteries with new ones.

If the Remote Commander is not to be used for a long period of time, remove the batteries to avoid possible damage from battery leakage.

Handling the Video Cassettes

Insertion

Insert the cassette with the side that has the window up (you can see the tape through the window)



Ejection

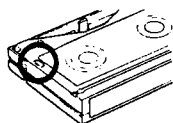
Press **EJECT**.
The cassette will be automatically ejected.

To Keep a Recorded Program from Being Accidentally Erased

When a new recording is made on a pre-recorded cassette, the previous recording will be erased automatically.

To avoid erasing a recording, break off the safety tab on the rear using a screwdriver or similar object.

To re-record, cover the opening with a piece of plastic tape.

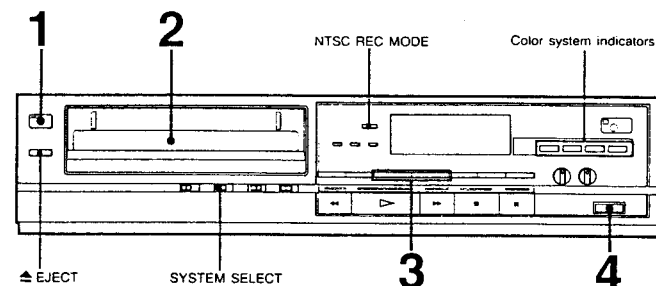


If the RECORD or TIMER REC is depressed, when the inserted cassette has its safety tab removed, the cassette will be automatically ejected.

Recording TV Programs

Before operating, complete the preparations on pages 15 to 16.

Numbers in the illustration show the sequence of operation.



Preparation

- Turn on the TV and select the channel number for the recorder.
- Make sure that nothing is connected to the LINE IN VIDEO and AUDIO jacks at the rear.
- Check that the SYSTEM SELECT switch is set according to the TV system in your area. Make sure that the SYSTEM SELECT switch is set to the appropriate color system and TV standard system according to the TV programs being received. Refer to page 15.
- For NTSC recording, set the NTSC REC MODE selector to either **II** or **III**.

Recording time available in each mode.

Cassette used	II	III
L-125	30 min.	45 min.
L-250	1 hr.	1 hr. 30 min.
L-500	2 hr.	3 hr.
L-750	3 hr.	4 hr. 30 min.
L-830	3 hr. 20 min.	5 hr.

1 Press ON/STANDBY.
The indicator will light up.

2 Insert a cassette.

3 Select the channel to be recorded with CHANNEL + / -.

4 Press RECORD.
The RECORD indicator will light and recording will begin.

By simply inserting a cassette without pressing ON/STANDBY.

The unit can also be automatically turned on.

To stop recording, press **STOP**.

When the tape reaches its end, it will be rewound to the beginning.

To turn off the unit, press ON/STANDBY.

To stop the tape momentarily during recording

Press **PAUSE**. The indicator above the button lights.

The TV program can still be seen on the TV, but the picture will not be recorded. To resume recording, press **PAUSE** again.

To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and recording will stop.

To view another TV program while recording
Select the channel you want to view on the TV.

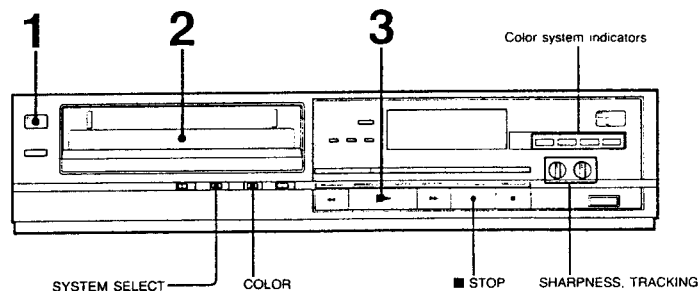
When the cassette is automatically ejected, the inserted cassette does not have the safety tab.

During recording of a color system program, the color system indicator will light to show the system in use.

In case you want to record a tape which is to be played back on another recorder from the very beginning of the tape, run the tape for about 15 seconds before starting recording. Otherwise you may miss the starting point during playback on the other machine.

Playback

Numbers in the illustration show the sequence of operation.



Preparation

- Turn on the TV and select the channel number for the recorder.
- Check that the SYSTEM SELECT switch is set according to the TV standard on which your TV receiver is based. Make sure that the SYSTEM SELECT switch is set to the appropriate color system according to the tape being played back. Refer to page 5.

1 Press ON/STANDBY.

The indicator will light up.

2 Insert a cassette.

The indicator on the button will light up and playback will begin.

3 Press ► PLAY.

To stop playing, press ■ STOP.
(Or press ▲ EJECT to take the cassette out.)

To rewind the tape, press ◀◀ REW.

To advance the tape rapidly, press ▶▶ FF.

To play back a cassette with its safety tab removed
By simply inserting the cassette without pressing ON/STANDBY, the unit will be automatically turned on and playback will begin.

When the tape reaches the end during playback, it will be automatically rewound.

Picture Adjustments

COLOR selector (Effective only when the video signal system is PAL and NTSC)

Normally set to 1. For more color intensity, set to 2 or 3.

SHARPNESS control

Normally set to the center detent position. Slide it toward SHARP for a sharp picture, or toward SOFT for a soft picture.

TRACKING control

If streaks or snow appear during playback of a tape recorded on another recorder, adjust it for the best possible picture. Return to the center detent position after playing back that particular tape.

Still Picture

To stop the tape for a moment

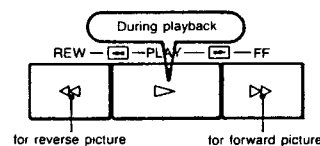
Press || PAUSE during playback. To resume playback, press || PAUSE again or press ► PLAY.

To protect the video heads and the tape, the pause mode will be automatically released after about 8 minutes and playback will resume.

Picture Search

To locate a particular point while viewing the picture

During playback, keep ►► FF pressed for a fast-speed forward picture, or keep ◀◀ REW pressed for a fast-speed reverse picture. To resume playback, release the button.



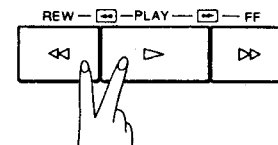
Streaks will appear and sound will be muted in the still picture search modes.



Auto Play

To rewind the tape and start playback from the beginning of the tape

In stop mode, keeping ◀◀ REW pressed, press ► PLAY.



The buttons on the Commander will function the same buttons on the recorder.

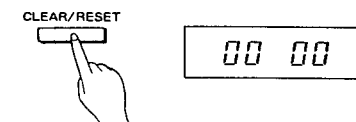
Use of the Tape Counter

The tape counter indicates the approximate running time of the tape and the relative position of programs on the tape. To display the tape counter, press CLOCK/COUNTER when the current time is displayed.

To Index the Tape Contents

Before starting recording or playback, press CLEAR/RESET to set the counter to "00 00".

By noting the counter reading at the desired point, you can easily find that point later by referring to the counter. Use the label on the cassette to list the programs and their counter readings.



Notes

- The counter reading is automatically reset to zero when a cassette is newly inserted.
- The counter reading will be retained in the memory even after the unit is turned off, as long as the cassette is in the cassette compartment.
- The counter will not advance during any portion of a tape that is blank or unrecorded. So the counter can be used to find unrecorded sections on a tape.

Automatic Stop

When the tape counter is displayed, rewinding stops at the tape counter's "0000" position. To rewind the tape further, press ◀◀ REW again.

When the current time is displayed, rewinding stops at the beginning of the tape.

Note

When the tape counter is displayed less than "0010", rewinding does not stop at the tape counter's "0000" position.

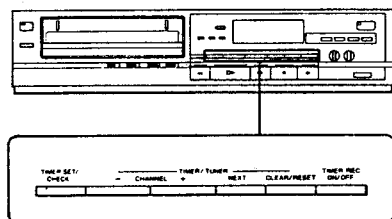
Timer-Activated Recording

One recording can be preset to be made for any day or every day within seven days.

Before Setting the Timer

- Make sure that the clock (day and time) is set correctly. See page 10.
- Make sure the cassette tape is long enough to record programs.
- Be sure the safety tab has not been removed. — If removed, the cassette will be automatically ejected when TIMER REC is pressed.
- Press ON/STANDBY to turn the power on.
- Be sure a cassette is inserted in the compartment.
- Make sure that nothing is connected to the LINE IN VIDEO and AUDIO jacks at the rear.
- Make sure that the SYSTEM SELECT switch is set correctly.

Suppose you want to make a recording of channel 6 from 7:10 to 11:15 on Friday morning.



CHANNEL +/- buttons

To set the day of the week, the time and the channel, press the + button to advance, and the - button to reverse.

NEXT button

Every time you press the NEXT button, the item to be preset will blink and you will be setting the item.

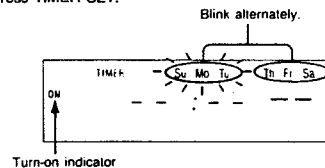
Day indication

By pressing the + button, the day indication changes as follows:

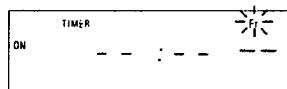
Ex. Today is Friday.

Su Mo Tu We Th Fr Sa → Fr → Sa → ... → Th
(every day) (today) (tomorrow)

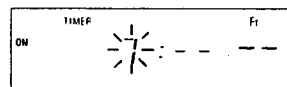
1 Press TIMER SET.



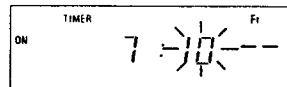
2 Set the day with the + or - button.



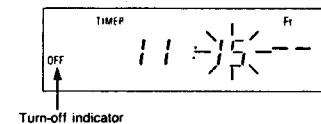
3 Press NEXT and set the turn-on hour with the + or - button.



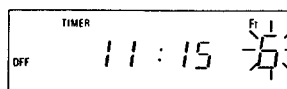
4 Press NEXT and set the minute with the + or - button.



5 Press NEXT and set the turn-off time as in steps 3 and 4.



6 Press NEXT and set the channel number to be recorded with the + or - button.

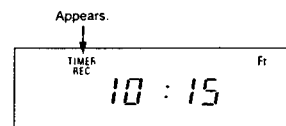


7 Press NEXT.

The turn-on time and turn-off time will be displayed for 3 seconds respectively and the current time will reappear.

8 Press TIMER REC.

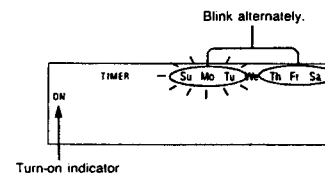
The power will be turned off and the recorder will be in the standby mode.



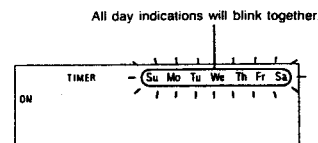
Recording will start at the preset time and will automatically stop when the recording is completed. When the recording is finished, the presetting (except the everyday setting) will be eliminated.

For Automatic Daily timer-activated recording

1 Press TIMER SET.



2 Press + button.



3 Press NEXT and follow the instructions for setting the time and channel number as shown on page 12.

NOTICE:

ONCE THE TIMER REC INDICATOR HAS BEEN DISPLAYED, only the functions of TIMER SET/CHECK and TIMER REC on the recorder can be activated. To turn on the power again for the usual manual operations, press TIMER REC again so that the indicator turns off. This does "not" affect the memory of the timer. As long as you press it again, timer recording will be made exactly as preset.

Before the Timer-Activated Recording Starts

To check the timer settings

When the TIMER REC indicator is displayed, press TIMER SET/CHECK. The preset turn-on time and turn-off time will be displayed for 3 seconds respectively and the current time will reappear.

To change the settings

- 1 Press TIMER REC. The TIMER REC indicator turns off.
- 2 Press TIMER SET/CHECK.
- 3 Press NEXT enough times until the item to be changed blinks.
- 4 Change the setting with the + or - button.
- 5 Press NEXT so that the current time appears.
- 6 Press TIMER REC again to reactivate the timer.

To erase the memory of the timer settings

- 1 Press TIMER REC. The TIMER REC indicator turns off.
- 2 Press TIMER SET/CHECK.
- 3 Press CLEAR/RESET. The memory of the settings will be eliminated.

To stop during a timer recording

Press TIMER REC. The recording will stop and the unit will be turned off.

When the tape ends during timer recording

The tape stops but the tape will not be rewound to the beginning.

If the power should be interrupted during timer recording

When the recorder is in the standby mode, the timer settings have been erased. Reset the clock and timer settings.

If the power interruption occurs while recording, the recording will then stop.

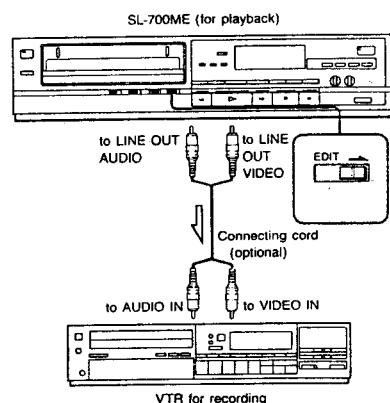
Editing Tapes

To edit a tape you will need another VTR.

CAUTION

Television programs, films, video tapes and other materials may be copyrighted. Unauthorized recording of such material may be contrary to the provisions of the copyright laws.

To edit from the SL-700ME to another VTR



Set the INPUT SELECT switch of the recording VTR to LINE (line input), if provided.

Function of the EDIT switch

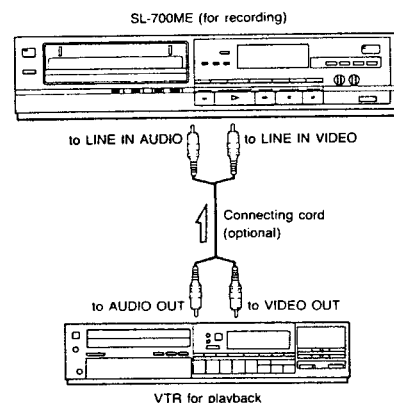
When editing from the SL-700ME to another VTR, set this switch to the arrow direction to improve the edited picture quality.

SYSTEM SELECT switch setting

When editing from another VTR, set the SYSTEM SELECT switch to appropriate color system according to the tape being played back. Refer to page 5.

To edit from another VTR to the SL-700ME

Connect the LINE IN VIDEO and AUDIO jacks of SL-700ME to the VIDEO OUT and AUDIO OUT jacks of the other VTR respectively.



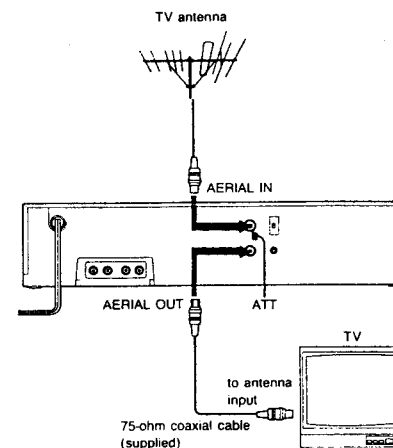
← signal flow

Antenna/Cable and TV Connection

Notes

- Unplug each unit from the wall outlet before making the following connections.
- Make sure the connections are secure. A loose connection may cause a noisy picture.

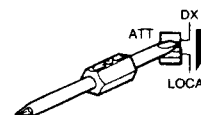
Connecting a TV



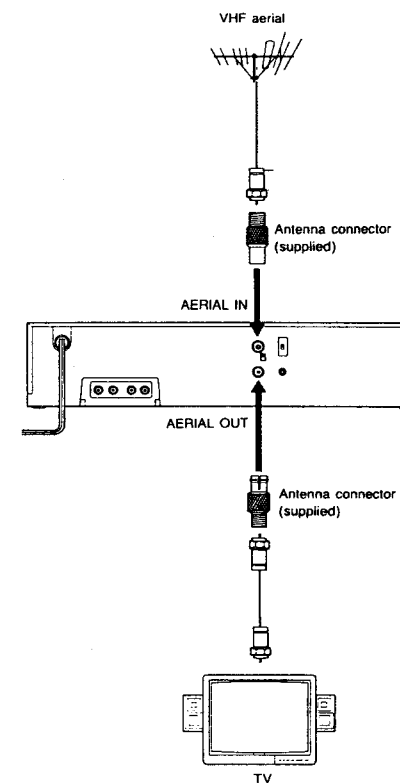
Now the recorder is set up to intercept all signals from the antenna on their way to the TV. The recorder then passes on the signals to the TV. This is why you can record a program while it is being shown on the TV, or while the TV is showing another program, or even when the TV is turned off.

Notice for customers in a strong signal area

The recorder has a booster to assure stable TV reception. However, in areas near TV stations, where the TV signal is very strong, the picture may be affected by the booster. If this happens, set the ATT switch on the rear panel to LOCAL using the ⊖ end of the supplied screwdriver.

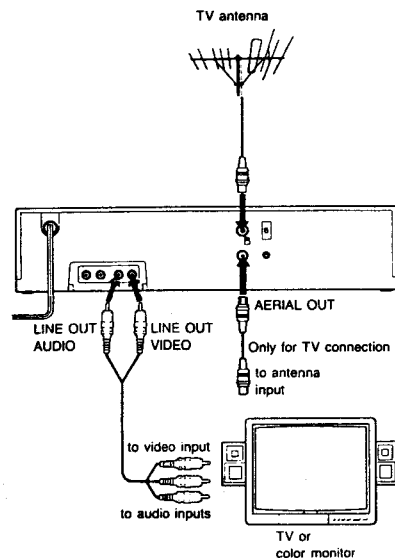


When your TV is equipped with 75-ohms F-type VHF connector, you use supplied antenna connector.



Connection for Better Playback Picture and Sound

— If your TV receiver/color monitor is equipped with video/audio inputs



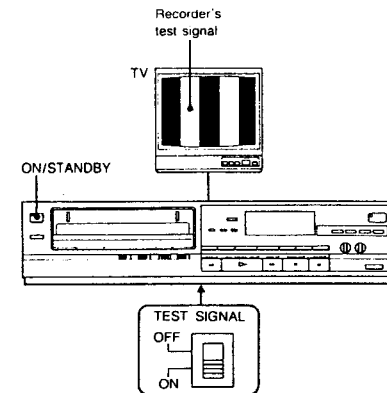
Connection with a color monitor
Connection between the recorder AERIAL OUT socket and the color monitor is not possible since the monitor is not equipped with a tuner. For this reason, you cannot watch a TV program while recording another program on the recorder.

When your TV is equipped with 75-ohms F-type VHF connector, you need use supplied antenna connector.

Adjusting the TV

One of the television channel number must be adjusted to receive the signal from the recorder.

Note that the adjustment is not necessary, however, when the recorder is connected to the video/audio inputs on the TV receiver/monitor.



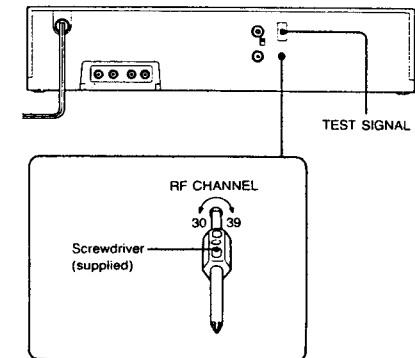
- 1 After making the connections, press ON/STANDBY.
- 2 Make sure that the recorder is in the stop mode.
- 3 Set TEST SIGNAL located at the rear of the recorder to ON. The test signal is transmitted on a channel between UHF channels E30 and E39 (American UHF channels A26 and A38).
- 4 Turn on the TV and select a channel number which is not being used to receive a TV station. Tune in the channel until you see a clear black and white pattern on the TV screen. This is the recorder's test signal.

• If you are not sure how to adjust your TV, please refer to the TV's instruction manual or consult your dealer.

Whenever you use this recorder, you should set the TV to the channel number selected in this adjustment.

If the test picture is free of disturbance, the TV adjustment is complete. Set TEST SIGNAL to OFF.

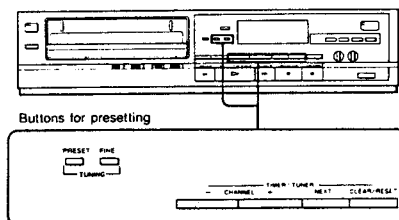
If the test picture is not free of disturbance



- 1 Reset TEST SIGNAL to OFF.
- 2 Adjust the channel of the TV to a channel between UHF channels E30 and E39 (American UHF channels A26 and A38) with the tuning control or the fine turning control on the TV, so that the TV screen shows no picture and so that a steady rustling sound or no sound is heard.
- 3 Set TEST SIGNAL to ON again.
- 4 Slowly turn the RF CHANNEL screw at the rear of the recorder with the $\ominus$ end of the supplied screwdriver, until you see an undistorted test pattern on the TV screen.
- 5 Now the TV adjustment is complete. Reset TEST SIGNAL to OFF.

Presetting TV Stations

This recorder has 12 channels. Once you preset the programs broadcast in your area, channel selection is simply made by pressing the CHANNEL + / - button.

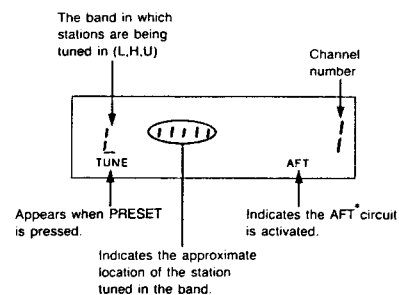


Before Presetting

- Make sure that the TV is set to the channel for the recorder.
- Make sure that nothing is connected to the LINE IN VIDEO and AUDIO jacks.
- Check that the SYSTEM SELECT switch is set according to the TV system in your area. Make sure that the SYSTEM SELECT switch is set to the appropriate color system and TV standard system according to the TV programs being received. Refer to page 5.

Display window

Check the indication during operation.



Presetting

- 1 Press PRESET.
The channel number display will blink.
- 2 Select a channel number with CHANNEL + / - for the desired station to be tuned in.
- 3 Press NEXT.
The band indicator and the tuning indicator will blink.
- 4 Tune in the desired station.
Press CHANNEL + to tune in a higher-frequency station, or - to tune in a lower-frequency station.

If the first station appearing on the screen is not the one you wish, repeat pressing CHANNEL + or - until the desired station appears.

- 5 Repeat steps 1 to 4 for other channel number to be preset.
- 6 Press NEXT.
The current time will appear.

*AFT (Automatic Fine Tuning) circuit

When a station is preset, the AFT circuit will automatically lock in to maintain a sharp picture. When the station is once fine-tuned, the AFT is deactivated and the AFT indicator goes off. To reactivate the AFT on that station, repeat the presetting procedure.

To Cancel an Unused Channel Number

- 1 Press PRESET.
The channel number display will blink.
- 2 Select the channel to be cancelled with CHANNEL + or -.
- 3 Press CLEAR/RESET.
The channel display will be changed to "-".

Then the cancelled channel will be skipped when CHANNEL + / - is pressed.

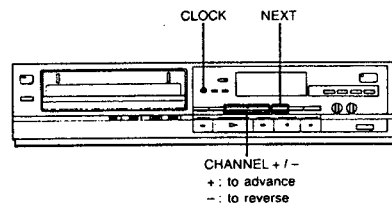
To Fine-Tune a Weak Station

When the picture of a particular station is not acceptable, fine-tune the station as follows.

- 1 Press FINE.
The band indicator and the tuning indicator will blink.
- 2 Keep CHANNEL + or - pressed until the picture becomes clearer.
The AFT indicator goes off.
- 3 Press NEXT.
The current time will reappear.

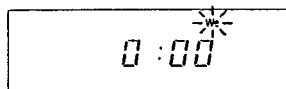
Setting the Clock

When you connect the AC power cord to a wall outlet, the clock indicates "Su 0:00" and it will blink to show that the clock is ready to be set.

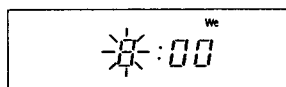


Example: to set for Wednesday morning 8:56

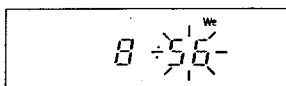
- 1 Press **CLOCK**.
Set the day with the + or - button until "We" (for Wednesday) appears.



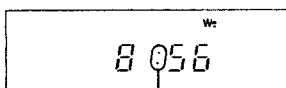
- 2 Press **NEXT**.
Set the hour with the + or - button until "8:00" appears.



- 3 Press **NEXT**.
Set the minute with the + or - button until "8:56" appears.



- 4 Press **NEXT**.
(For accurate setting, press NEXT at the same time with an announced time signal.)
The clock will now show the current time.



The dots of the colon (:) alternately blink every 30 seconds.

About the day of the week

The day indication in the display window shows as follows.

Su = Sunday
Mo = Monday
Tu = Tuesday
We = Wednesday
Th = Thursday
Fr = Friday
Sa = Saturday

CHANNEL +/- buttons

The + and - buttons can be used in two ways:

When you keep a button pressed, the digits will advance continuously until the button is released.



When you press and immediately release a button, the digits will advance by one.



Trouble Checks

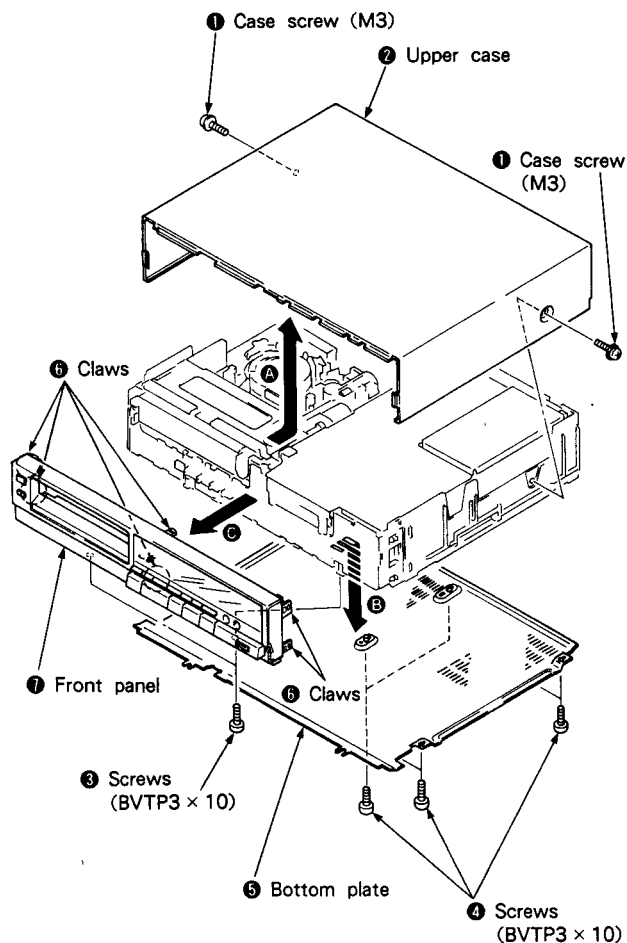
If any difficulty should arise during operation, first check the power cord connection, then go through the following list. Should the difficulty persist, unplug the unit and contact your Sony dealer or local authorized Sony service facility.

	Symptom	Possible causes
GENERAL	The ON/STANDBY switch does not function.	TIMER REC is pressed. Check in the window.
	Clock display blinks, showing 0:00.	The power has been interrupted. Reset the clock and the timer settings.
	Cassette cannot be inserted.	• A cassette is already in the compartment. • The cassette is wrong side up.
	The VTR program is not displayed on the TV screen.	• Connections are incorrect. • The channel number for the VTR is not correctly adjusted on the TV receiver.
RECORDING	Recording cannot be made.	• No cassette has been inserted. • The safety tab has been removed from the cassette. • The tape is at its end.
	TV recording has not been made correctly.	• The antenna is not correctly connected. • A cable is connected to the LINE IN VIDEO and/or AUDIO jacks. • The tape is at its end.
	The cassette is ejected when RECORD or TIMER REC is pressed.	The safety tab has been removed from the cassette.
	Timer recording has not been made correctly.	• There has been a power interruption. • The clock time is not set correctly. • The turn-on and turn-off times have not been set properly. • The tape is at its end. • TIMER REC has not been pressed.
PLAYBACK	Streaks or snow on the playback picture	A tape recorded on another recorder is being played back. Adjust TRACKING until you get the best possible picture. Allow a second or two for the new settings to take effect. When playback of this particular cassette is finished, return the control to its center detent position.
	Noisy picture	The video heads may be contaminated. Clean the heads using the Sony L-25CL video head cleaning cassette. For details on cleaning, refer to the instructions furnished with the cleaning cassette. If the cleaning cassette is not available in your area, have the heads cleaned at the nearest Sony service facility.

SECTION 2 DISASSEMBLY

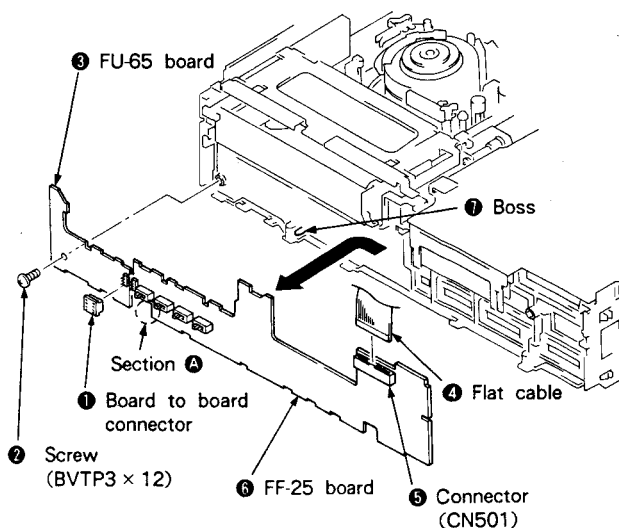
2.1. REMOVAL OF CABINET

- 1) Remove two case screws ①.
- 2) Remove the upper case ② in the direction of arrow A.
- 3) Remove two screws ③.
- 4) Loosen six screws ④.
- 5) Remove the bottom plate ⑤ in the direction of arrow B.
- 6) Disengage the claws ⑥ in six places.
- 7) Remove the front panel ⑦ in the direction of arrow C.



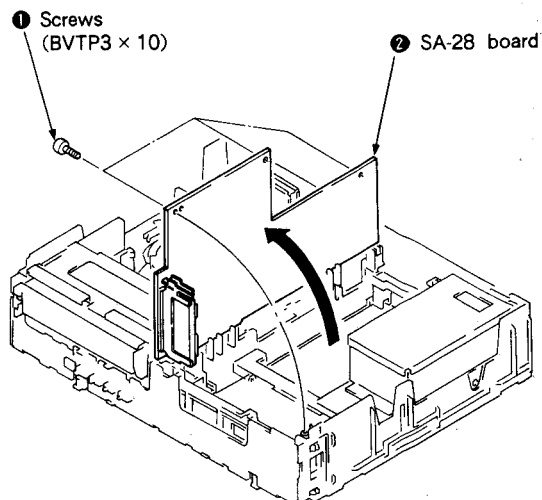
2.2. REMOVAL OF THE FF-25 AND FU-65 BOARDS

- 1) Remove the board to board connector ①.
- 2) Remove the screw ②.
- 3) Remove the FU-65 board ③ in the direction of arrow.
- 4) Remove the flat cable ④ from the connector (CN501) ⑤.
- 5) Remove the FF-25 board ⑥ from boss ⑦ by bending section A forward carefully, paying attention not to break it.
- 6) Remove the FF-25 board ⑥ in the direction of arrow.



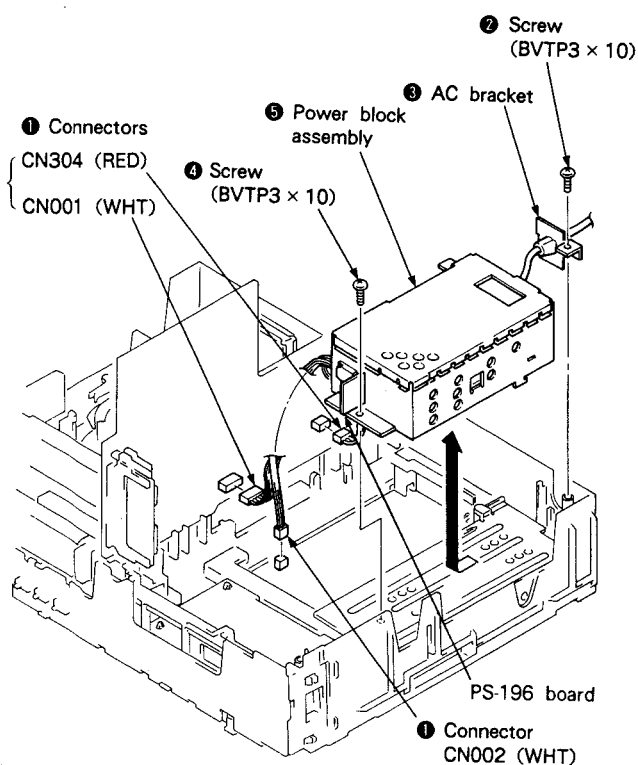
2.3. OPENING THE SA-28 BOARD

- 1) Remove three screws ①.
- 2) Open the SA-28 board ② in the direction of arrow.



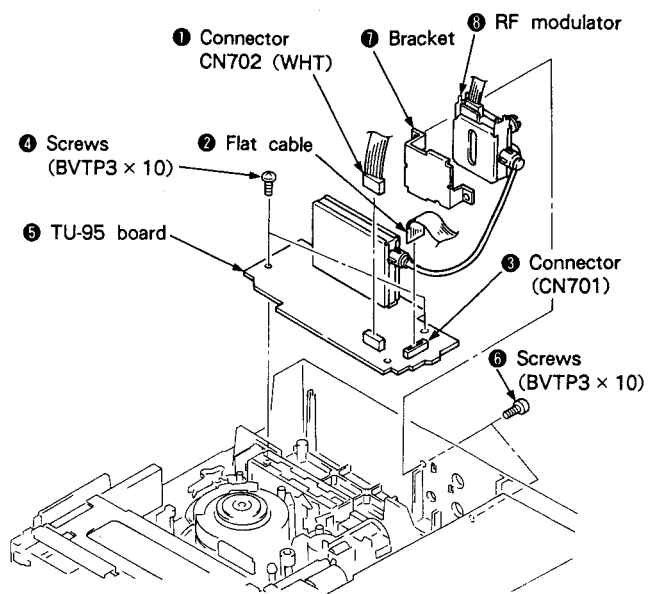
2.4. REMOVAL OF POWER BLOCK ASSEMBLY

- 1) Remove three connectors (CN001, CN002, CN304) ①.
- 2) Remove the screw ②.
- 3) Remove the AC bracket ③.
- 4) Remove the screw ④.
- 5) Remove the power block assembly ⑤ in the direction of arrow.



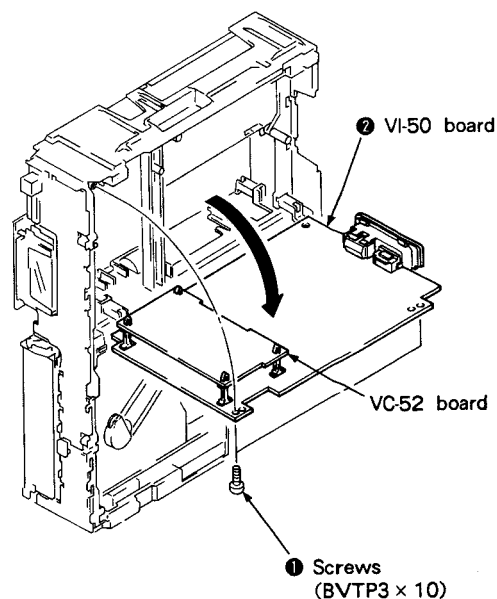
2.5. REMOVAL OF THE TU-95 BOARD AND RF MODULATOR

- 1) Remove the connector (CN702) ①.
- 2) Remove the flat cable ② from the connector (CN701) ③.
- 3) Remove two screws ④.
- 4) Remove the TU-95 board ⑤.
- 5) Remove two screws ⑥.
- 6) Remove the bracket ⑦ and RF modulator ⑧.



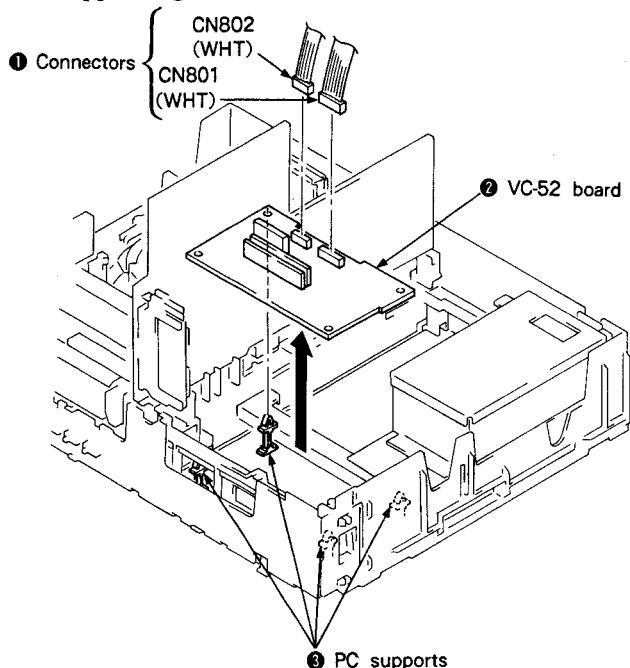
2.6. OPENING THE VI-50 BOARD

- 1) Remove two screws ①.
- 2) Open the VI-50 board ② in the direction of arrow.



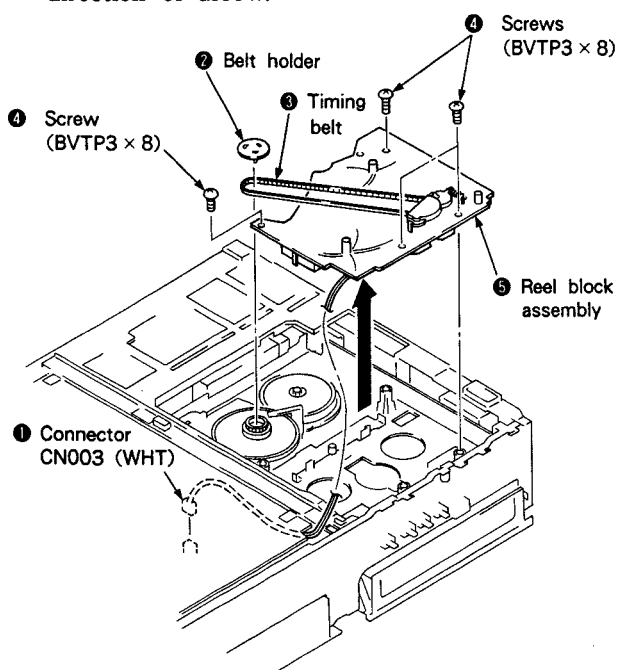
2-7. REMOVAL OF THE VC-52 BOARD

- 1) Remove two connectors (CN801, CN802) ①.
- 2) Remove the VC-52 board ② from the four PC supports ③.



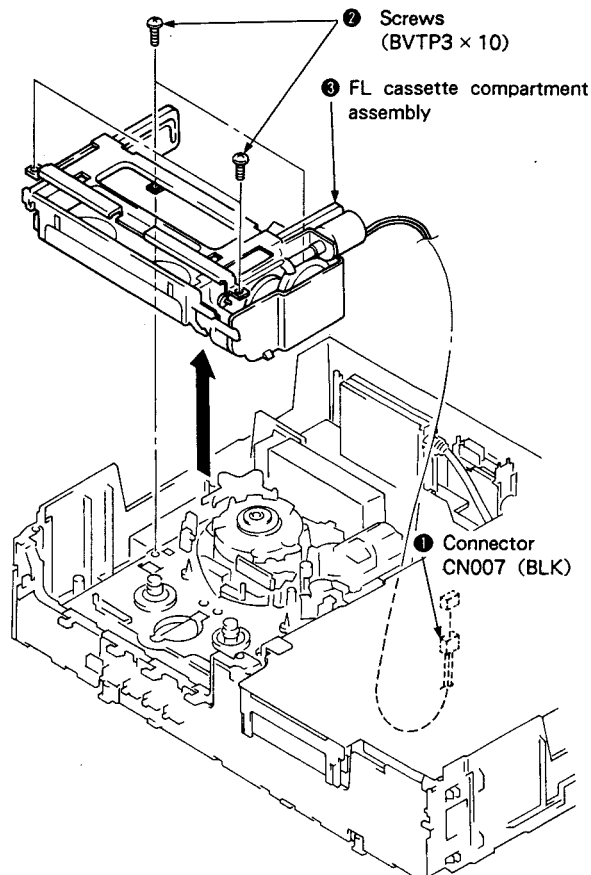
2-8. REMOVAL OF REEL BLOCK ASSEMBLY

- 1) Remove the connector (CN003) ① from the SA-28 board.
- 2) Remove the belt holder ②.
- 3) Remove the timing belt ③ from gear of the capstan motor.
- 4) Remove four screws ④.
- 5) Remove the reel block assembly ⑤ in the direction of arrow.



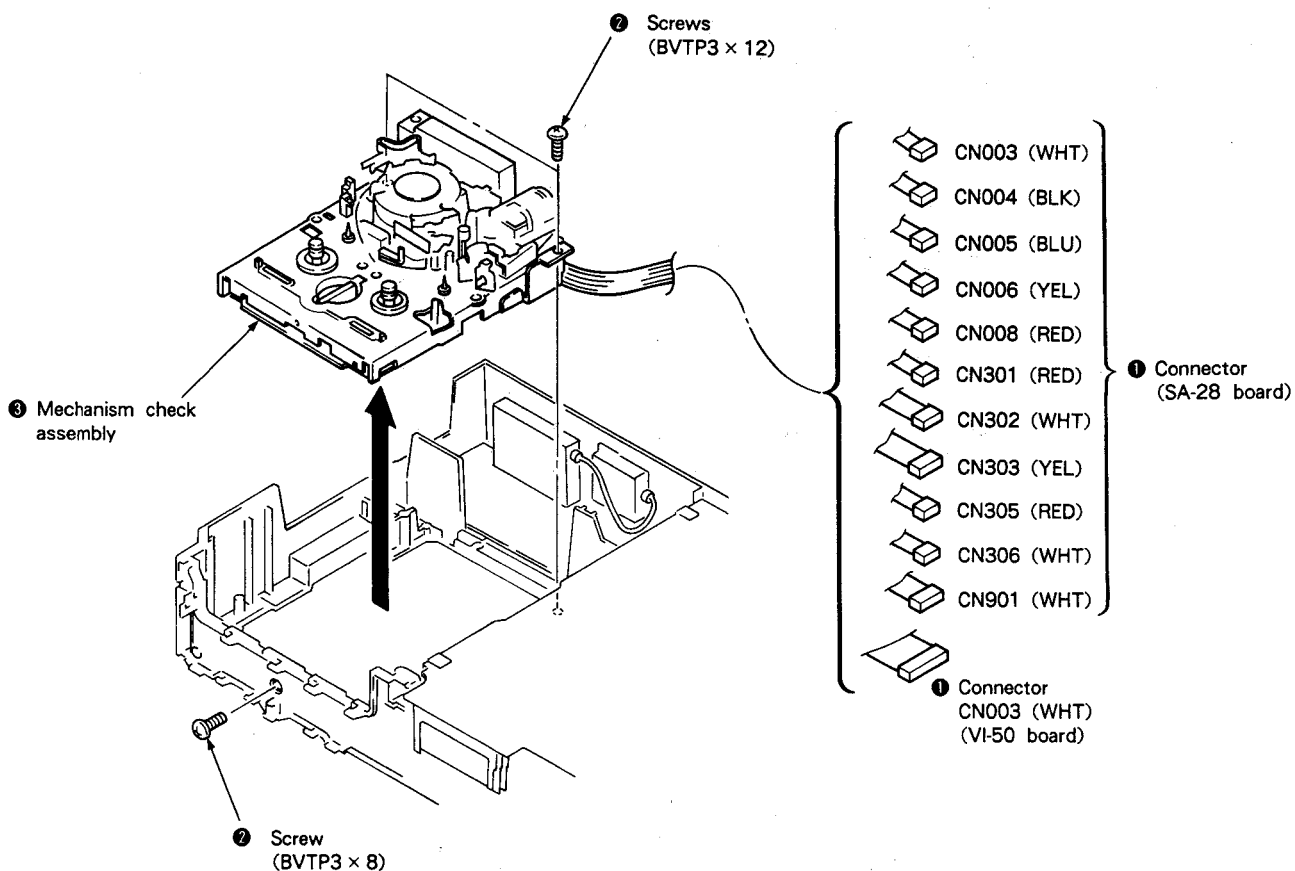
2-9. REMOVAL OF FL CASSETTE COMPARTMENT ASSEMBLY

- 1) Remove the connector (CN007) ① from the SA-28 board.
- 2) Remove four screws ②.
- 3) Remove the FL cassette compartment assembly ③ in the direction of arrow.



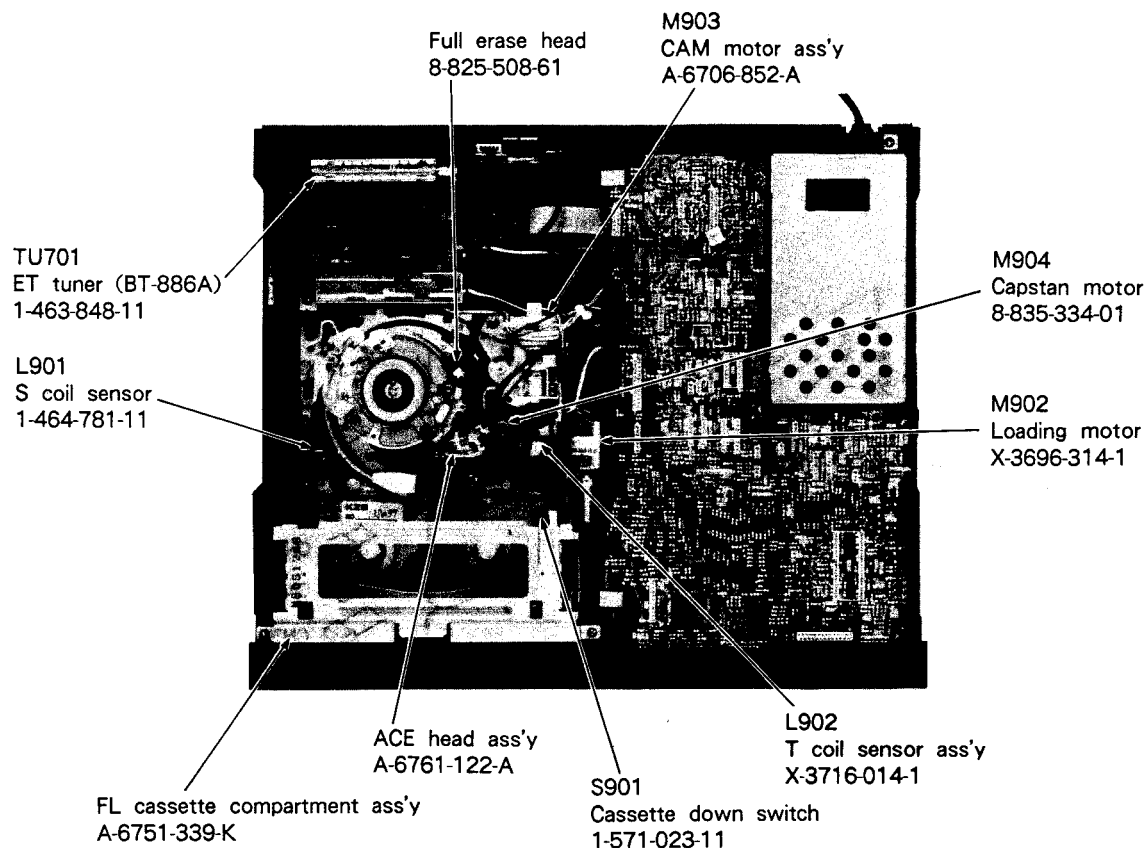
2-10. REMOVAL OF MECHANISM DECK ASSEMBLY

- 1) Remove twelve connectors (CN003 to CN006, CN008, CN301 to CN303, CN305, CN306, CN901, CN003) ❶.
- 2) Remove three screws ❷.
- 3) Remove the mechanism deck assembly ❸ in the direction of arrow.

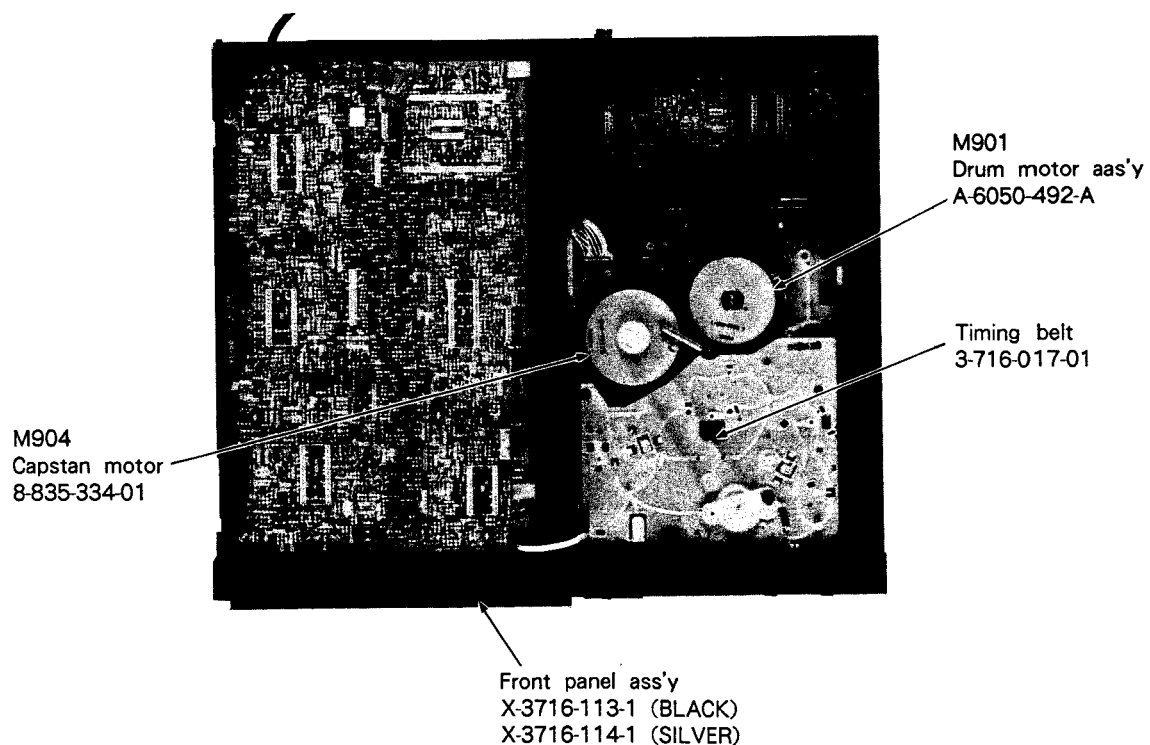


2-11. INTERNAL VIEW

— TOP SIDE —

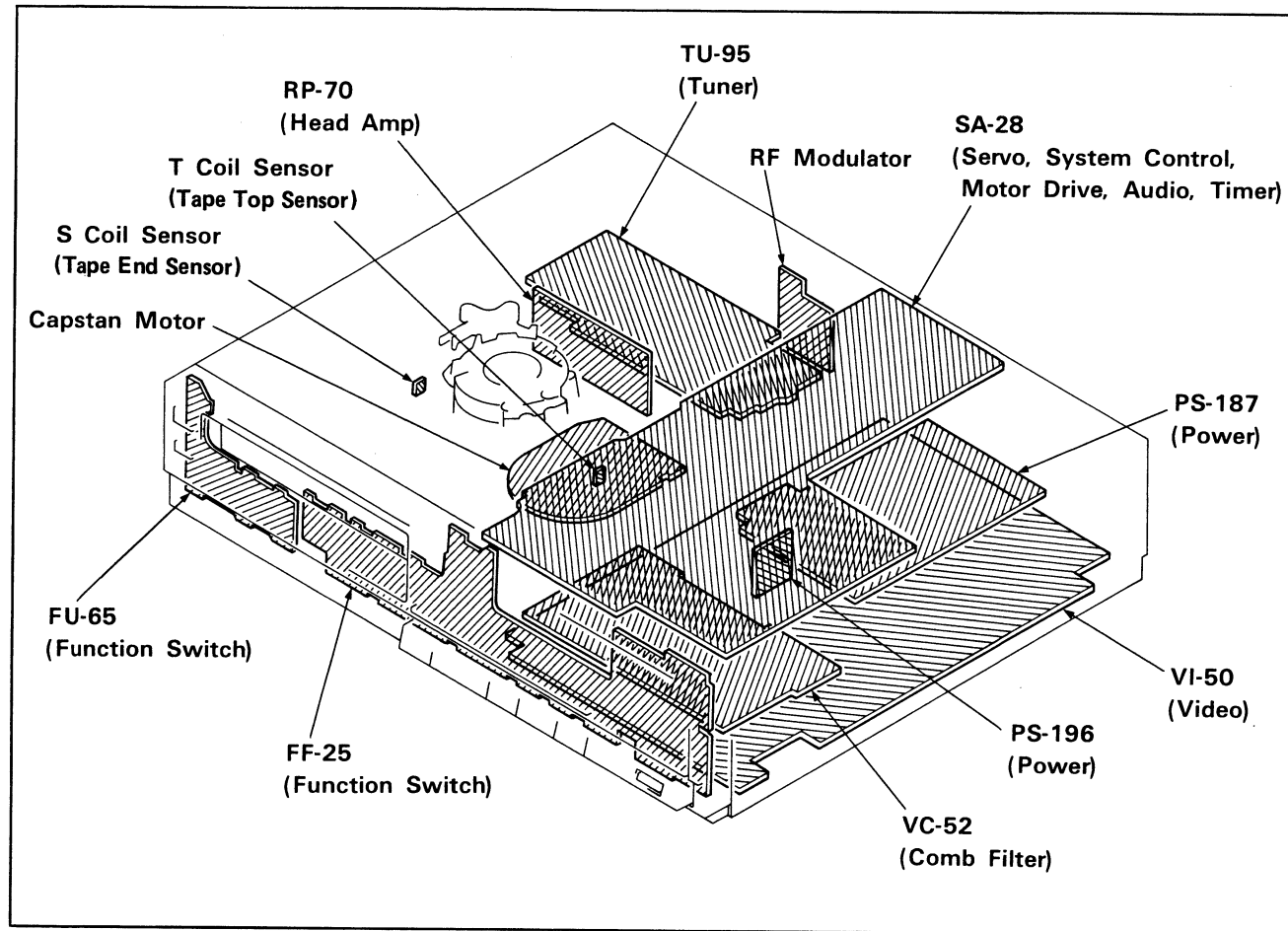


— Bottom side —

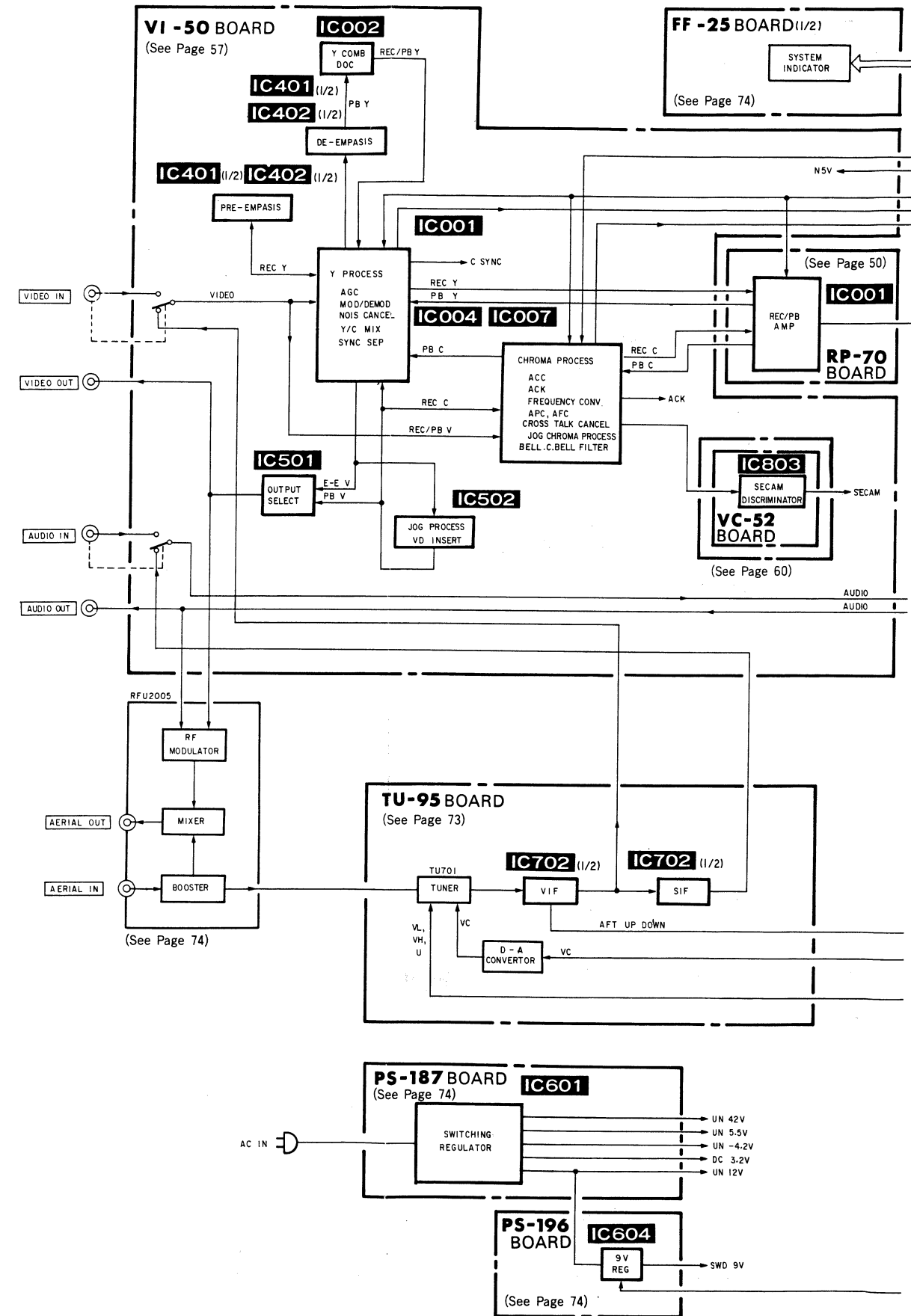


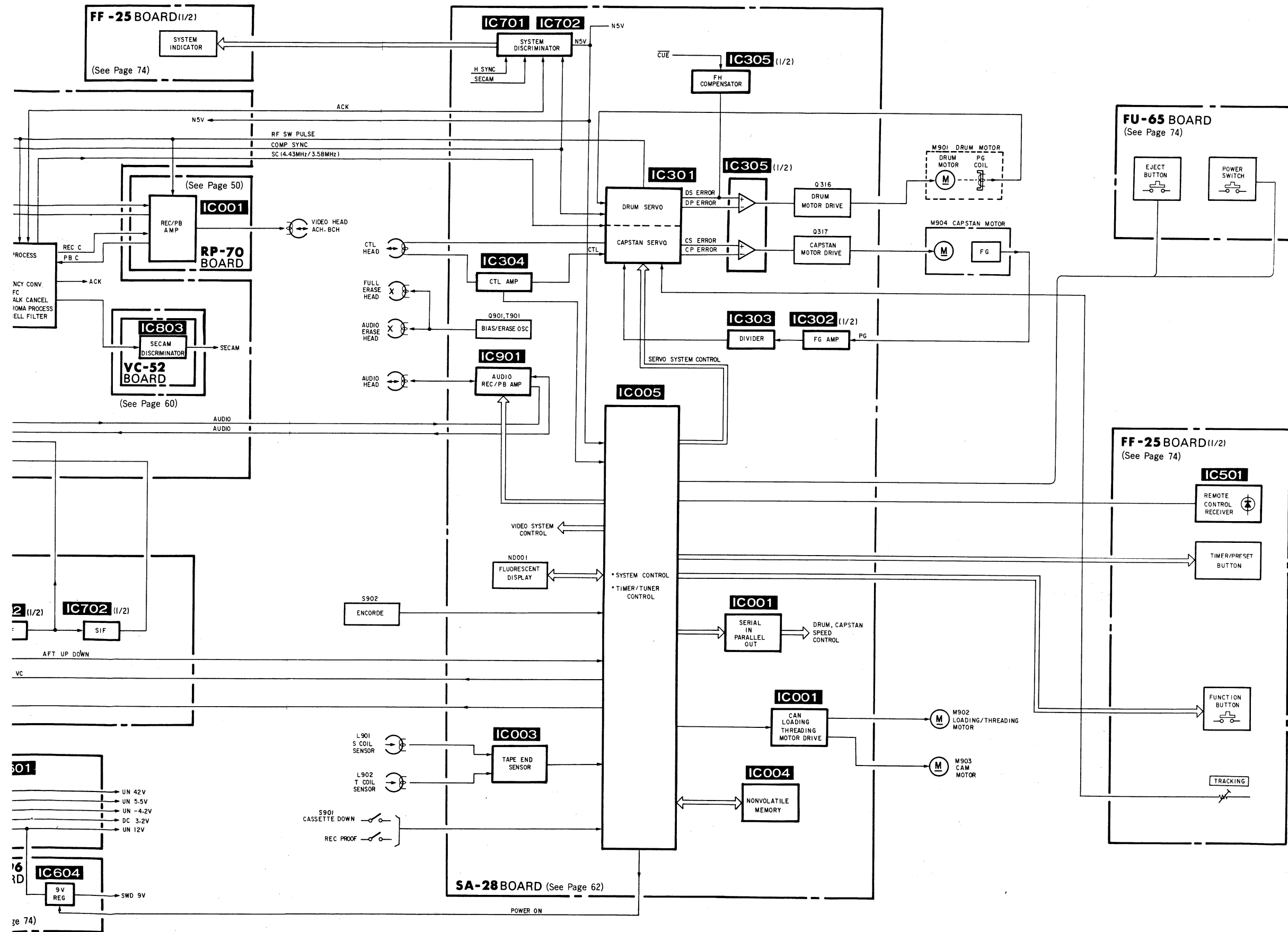
SECTION 3 DIAGRAMS

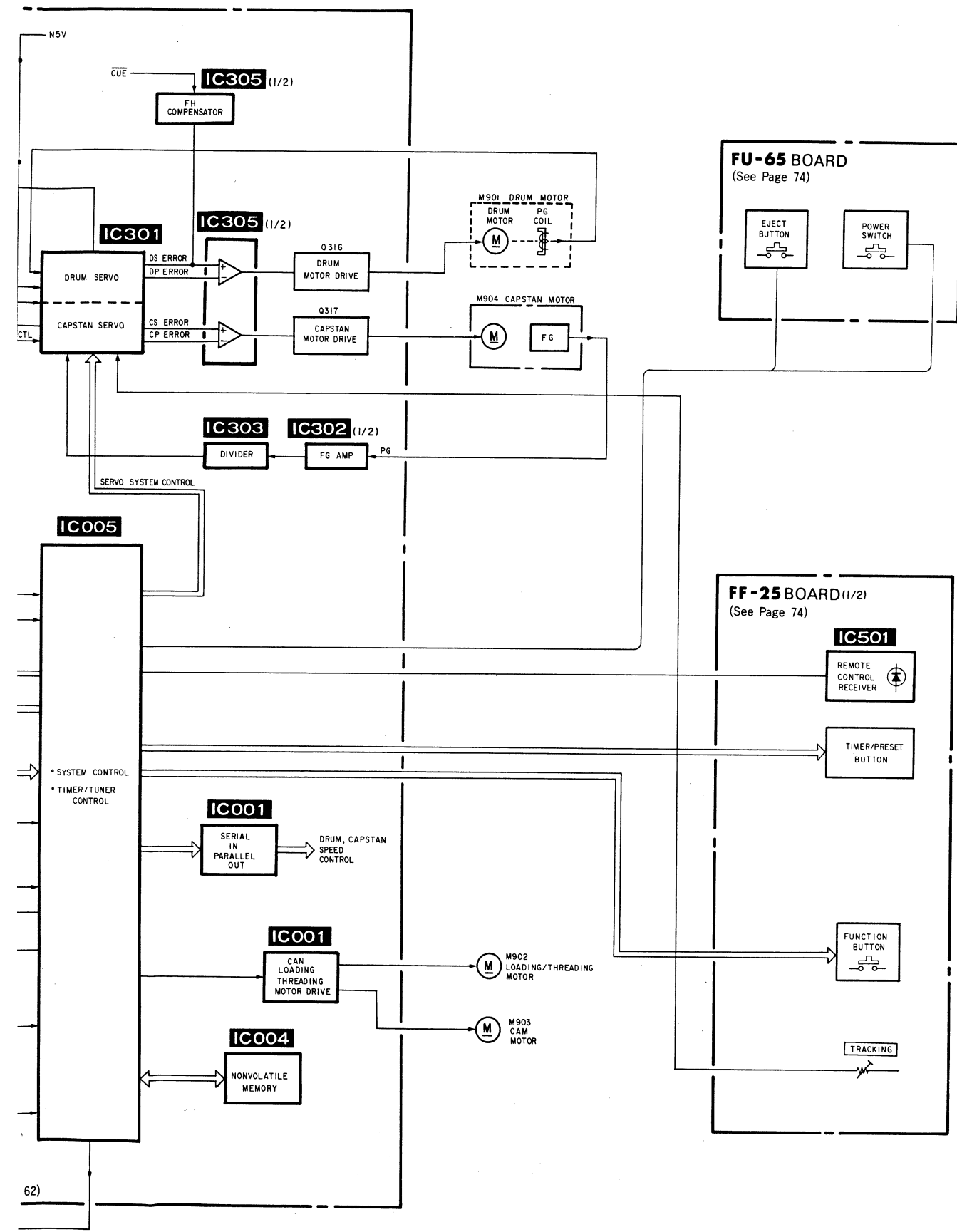
3-1. CIRCUIT BOARDS LOCATION

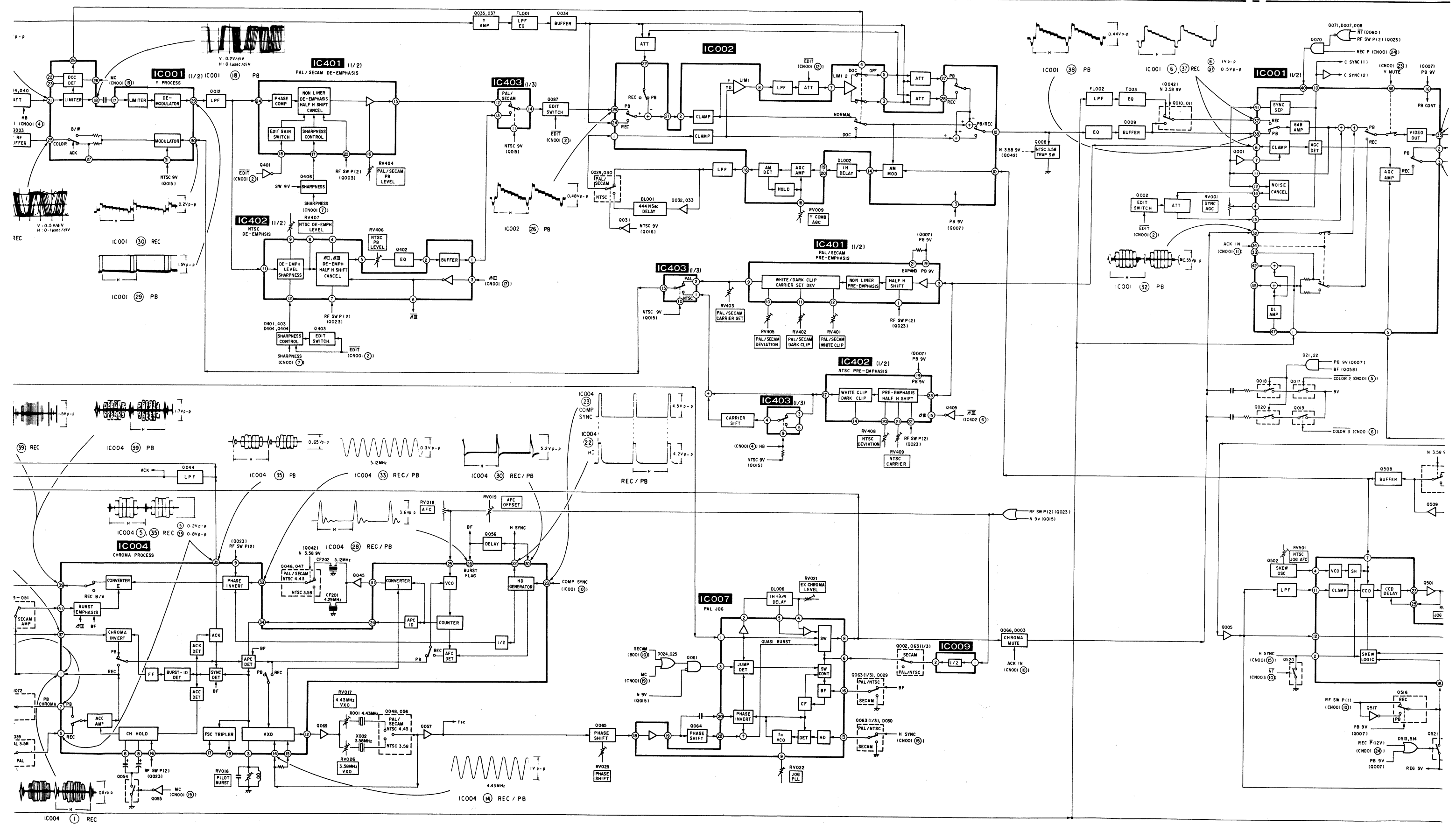


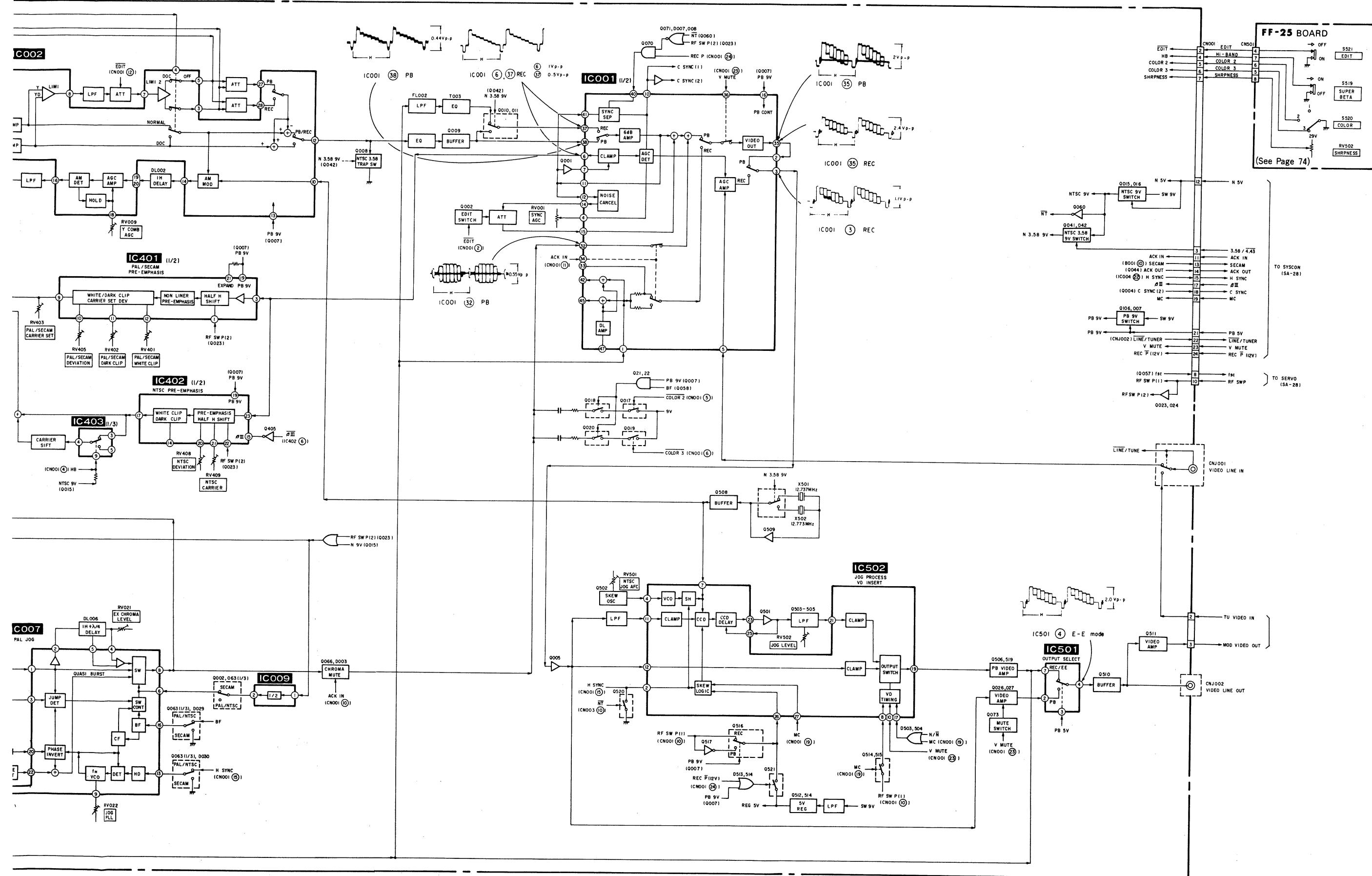
3-2. OVERALL BLOCK DIAGRAM



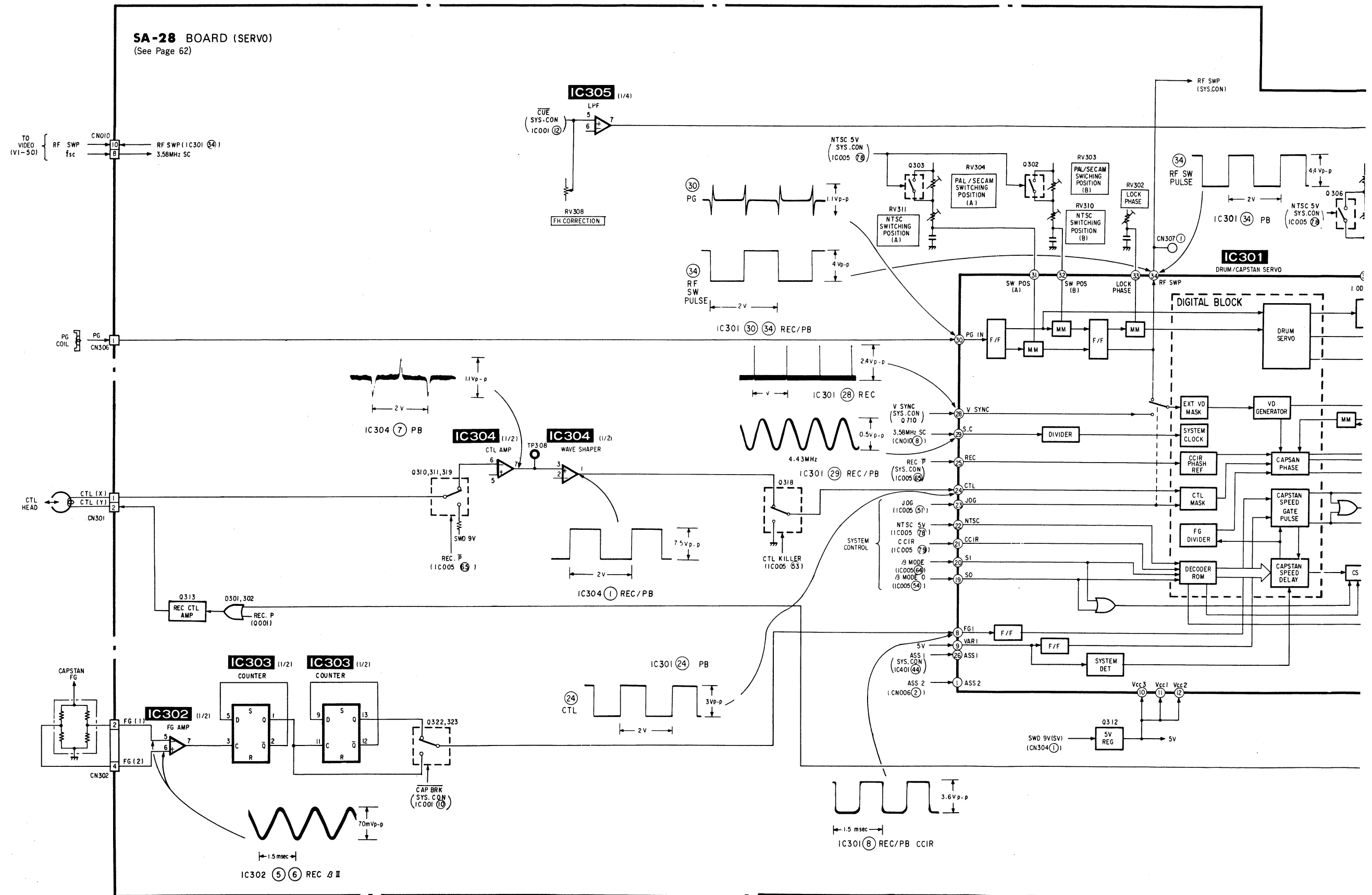


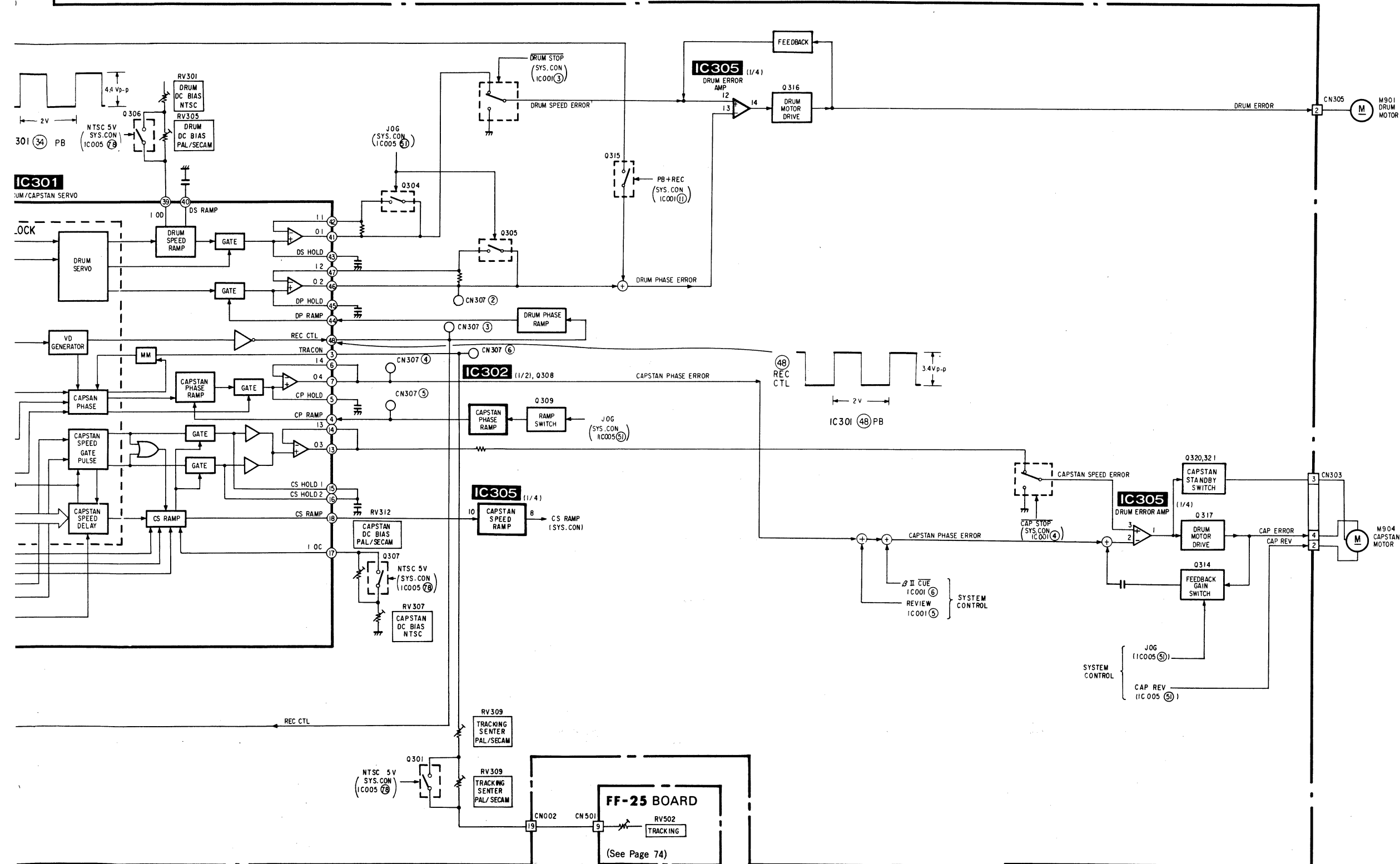






3-4. SERVO BLOCK DIAGRAM







3-6. SYSTEM CONTROL — VIDEO, AUDIO INTERFACE

SIGNAL	MODE		STOP	FF	REW	CUE	REV	PB	PB · P	REC	REC · P
	I/O	Pin No.									
A-MUTE	O	IC005 ⑦ Pin	L	L	L	H	H	L	H	L	L
PB-OUT	O	IC005 ⑩ Pin	L	L	L	H	H	H	H	L	L
REC · P	O	IC005 ⑤ Pin	L	L	L	L	L	L	L	H	L
V-MUTE	O	IC005 ① Pin	L	L	L	L	L	L	L	L	L
MC	O	IC005 ③ Pin	L	L	L	H	H	L	H	L	L
LINE/ TUNER	I	IC005 ③ Pin	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1	* 1

* 1 : "L" when pin jack in Video IN.

3-7. SYSTEM CONTROL — SERVO INTERFACE

SIGNAL	MODE		STOP	FF	REW	CUE	REV	PB	PB · P	REC	REC · P
	I/O	Pin No.									
CAP-REV	O	IC005 ④ Pin	L	L	H	L	H	L	L	L	L
β MODE 0	O	IC005 ⑤ Pin	H	L	L	L/H	L/H	L/H	L/H	L/H	L/H
β MODE 1	O	IC005 ④ Pin	L	H	H	L/H	L/H	L/H	L/H	L/H	L/H
CS-RAMP	I	IC005 ⑤ Pin	H						H		H
JOG	O	IC005 ⑤ Pin	L	H	H	H	H	L	L	L	L
CTL-KILLER	O	IC005 ③ Pin	L	H	H	L	L	L	L	L	L
CTL	I	IC005 ⑦ Pin	L/H	* 1	* 1	* 1	* 1	* 1	L/H	* 1	L/H
ASS2 (LOAD -)	O	IC005 ⑦ Pin	L	L	L	H	H	L	L	H	H
DRUM-STOP	O★	IC001 ③ Pin	L	H	H	H	H	H	H	H	H
CAP-STOP	O★	IC001 ④ Pin	L	H	H	H	H	H	L	H	L
REVIEW	O★	IC001 ⑤ Pin	L	L	L	L	H	L	L	L	L
β II · CUE	O★	IC001 ⑥ Pin	H	H	H	* 2	H	H	H	H	H
CAP-BRK	O★	IC001 ⑩ Pin	H	H	L	H	H	H	H	H	H
PB + REC	O★	IC001 ⑪ Pin	H	H	H	L	L	H	H	H	H
CUE	O★	IC001 ⑫ Pin	H	H	H	L	H	H	H	H	H

★ Open · collector output

* 1 : When there is CTL : 
When there is no CTL : "L" or "H".
* 2 : "L" when is β II, other "H".

3-8. SYSTEM CONTROL — TUNER INTERFACE

SIGNAL	MODE		VL	VH	U
	I/O	Pin No.			
V•L	O	IC005 ② Pin	H	L	L
V•H	O	IC005 ③ Pin	L	H	L
U	O	IC005 ④ Pin	L	L	H
AFT-UP	I	IC005 ⑪ Pin	L	L	L
AFT-DN	I	IC005 ⑫ Pin	L	L	L
PWM	O	IC005 ⑩ Pin			
MNOS	O	IC005 ⑥ Pin	* 1	* 1	* 1
I/O4	I/O	IC005 ⑩ Pin	* 2	* 2	* 2
I/O3	I/O	IC005 ⑨ Pin	* 3	* 3	* 3
I/O2	I/O	IC005 ⑧ Pin	* 4	* 4	* 4
I/O1	I/O	IC005 ⑦ Pin	* 5	* 5	* 5
CLK	O	IC005 ⑫ Pin	* 6	* 6	* 6

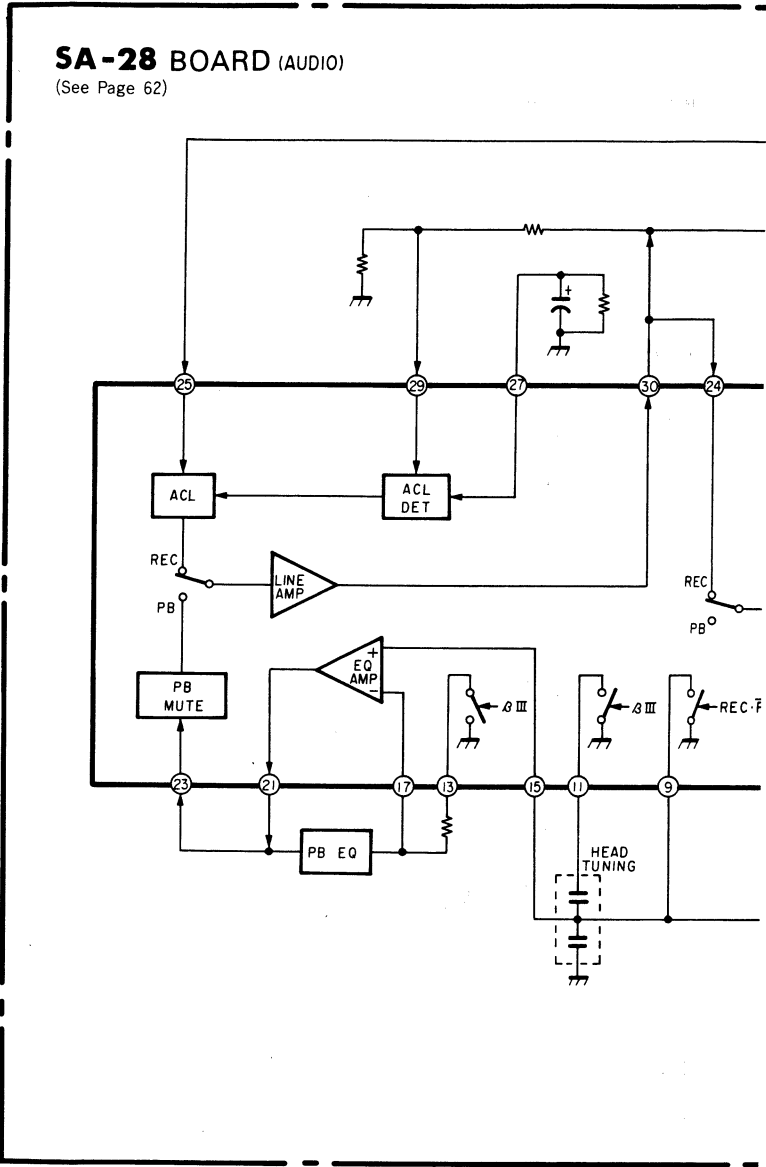
- * 1 : "L" in time of MNOS Read/write mode only.
- * 2 : MNOS Data in time of Read/write mode only, the others C-DN.
- * 3 : MNOS Data in time of Read/write mode only, the others C-ON.
- * 4 : MNOS Data in time of Read/write mode only, the others E-0. (encode signal : bit 0)
- * 5 : MNOS Data in time of Read/write mode only, the others E-1. (encode signal : bit 1)
- * 6 : MNOS CLOCK OUT PUT in time of Read/write mode only, the others AFT-DN IN PUT.

3-9. SYSTEM CONTROL — MECHANISM BLOCK INTERFACE

SIGNAL	MODE		STOP	FF	REW	CUE	REV	PB	PB • P	REC	REC • P	EJECT
	I/O	Pin No.										
CAM -	O	IC005 ⑤ Pin	L	L	L	L	L	L	L	L	L	L
CAM +	O	IC005 ⑤ Pin	L	L	L	L	L	L	L	L	L	L
LOAD -	O	IC005 ⑦ Pin	L	L	L	H	H	L	L	H	H	L
LOAD +	O	IC005 ⑧ Pin	L	L	L	H	H	L	L	H	H	L
TOP/END	O	IC005 ⑨ Pin	L	L	H	L	H	L	L	L	L	L/H
END-SENS	I	IC005 ⑩ Pin	H	H	H	H	H	H	H	H	H	L
FF LED	O	IC005 ⑧ Pin	Hz		Hz	Hz	Hz	Hz	Hz	Hz	Hz	Hz
REW LED	O	IC005 ⑦ Pin	Hz	Hz		Hz	Hz	Hz	Hz	Hz	Hz	Hz
PAUSE LED	O	IC005 ⑥ Pin	Hz	Hz	Hz	Hz	Hz	Hz		Hz		Hz
REC LED	O	IC005 ⑤ Pin	Hz	Hz	Hz	Hz	Hz	Hz	Hz			Hz
LOAD	O	IC005 ④ Pin										
SC	O	IC005 ④ Pin										
SO	O	IC005 ⑤ Pin										
RESET	I	IC005 ⑫ Pin	H	H	H	H	H	H	H	H	H	H
POWER	O	IC005 ⑫ Pin	H	H	H	H	H	H	H	H	H	H
SIRCS-IN	I	IC005 ⑫ Pin										
C-DN	I	IC005 ⑩ Pin	L	L	L	L	L	L	L	L	L	H
C-ON	I	IC005 ⑩ Pin	* 1	* 1	* 1	* 1	* 1	* 1	* 1	L	L	H
E0	I	IC005 ⑩ Pin	L	L	L	H	H	H	H	H	H	H
E1	I	IC005 ⑩ Pin	H	L	L	L	L	L	L	L	L	H

- * 1 : "H" when cassette erase prevention claw is broken.
- "L" when cassette erase prevention claw is not broken.

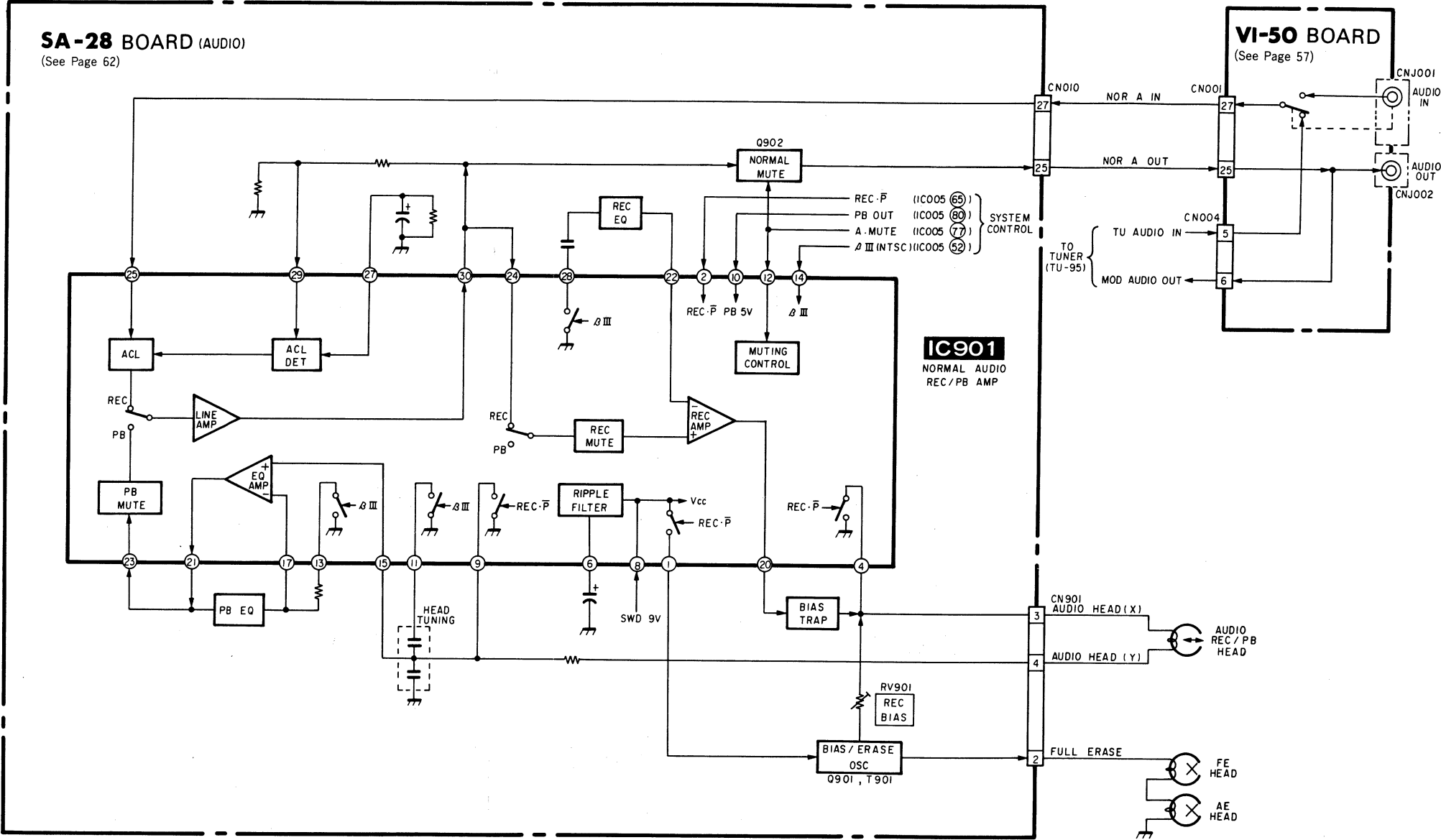
3-10. AUDIO BLOCK DIAGRAM



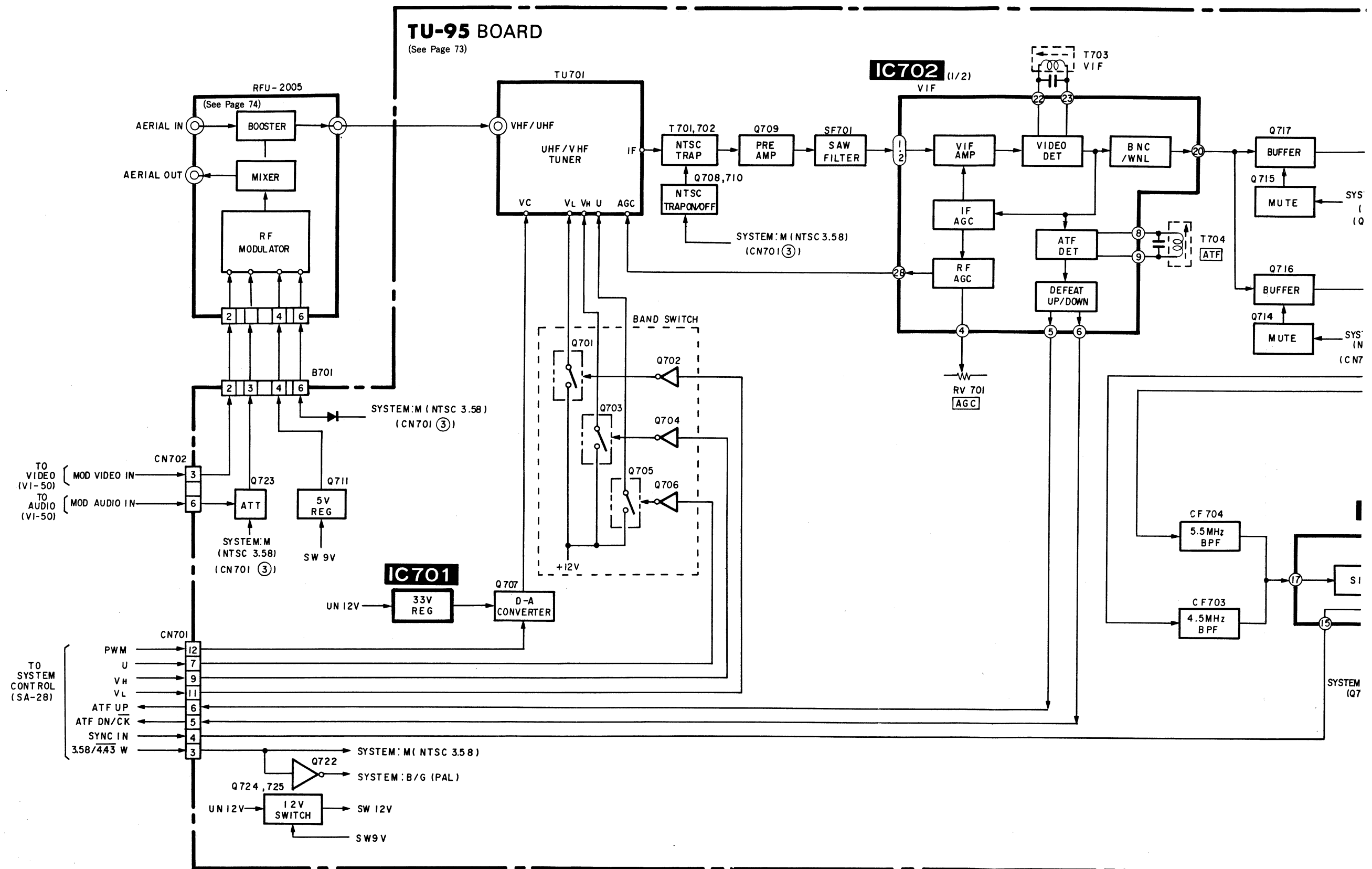
INTERFACE

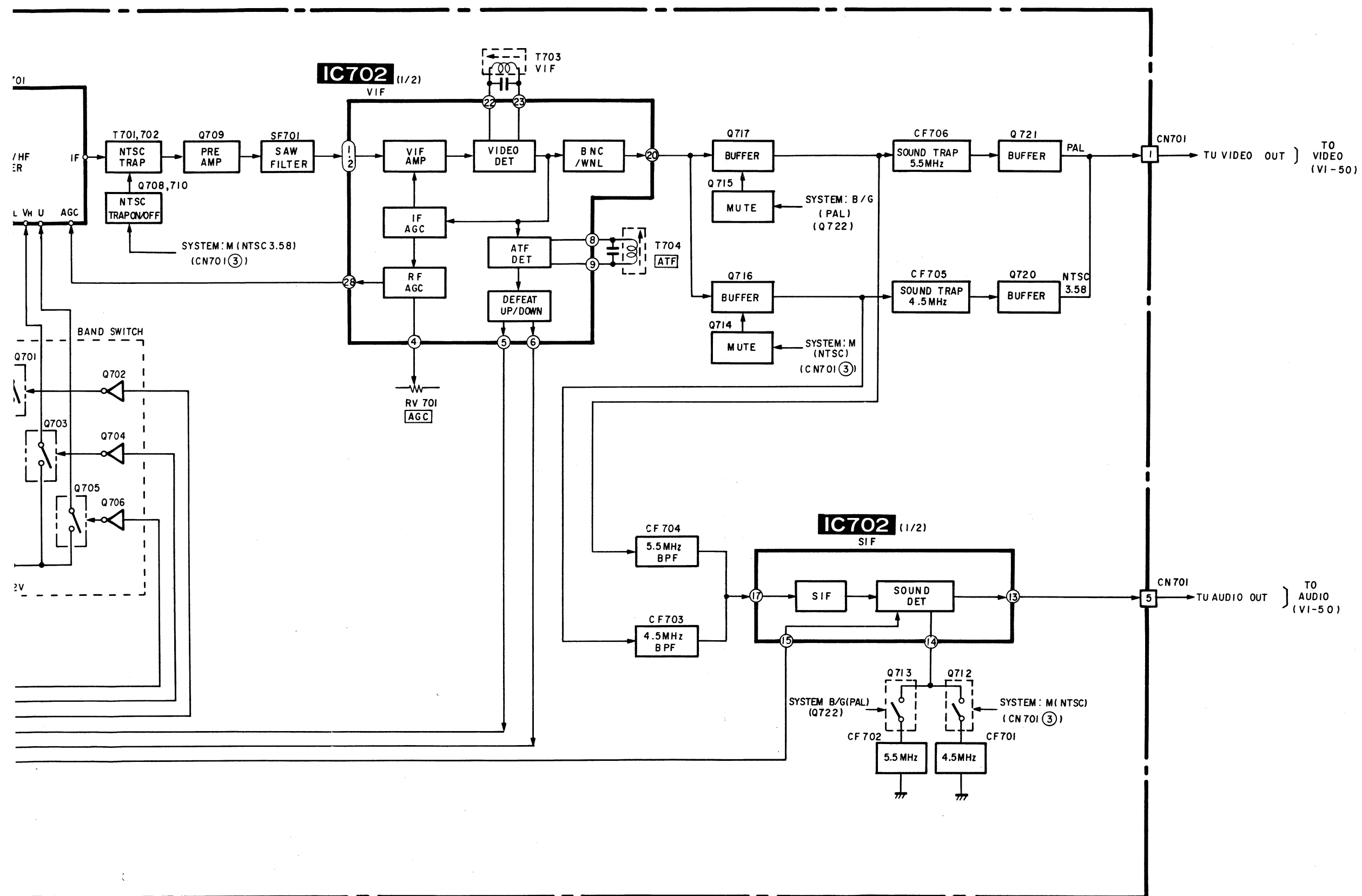
3-10. AUDIO BLOCK DIAGRAM

CUE	REV	PB	PB · P	REC	REC · P	EJECT
L	L	L	L	L	L	L
L	L	L	L	L	L	L
H	H	L	L	H	H	L
H	H	L	L	H	H	L
L	H	L	L	L	L	L/H
H	H	H	H	H	H	L
Hz	Hz	Hz	Hz	Hz	Hz	Hz
Hz	Hz	Hz	Hz	Hz	Hz	Hz
Hz	Hz	Hz		Hz		Hz
Hz	Hz	Hz	Hz			Hz
						
						
						
H	H	H	H	H	H	H
H	H	H	H	H	H	H
						
L	L	L	L	L	L	H
*1	*1	*1	*1	L	L	H
H	H	H	H	H	H	H
L	L	L	L	L	L	H

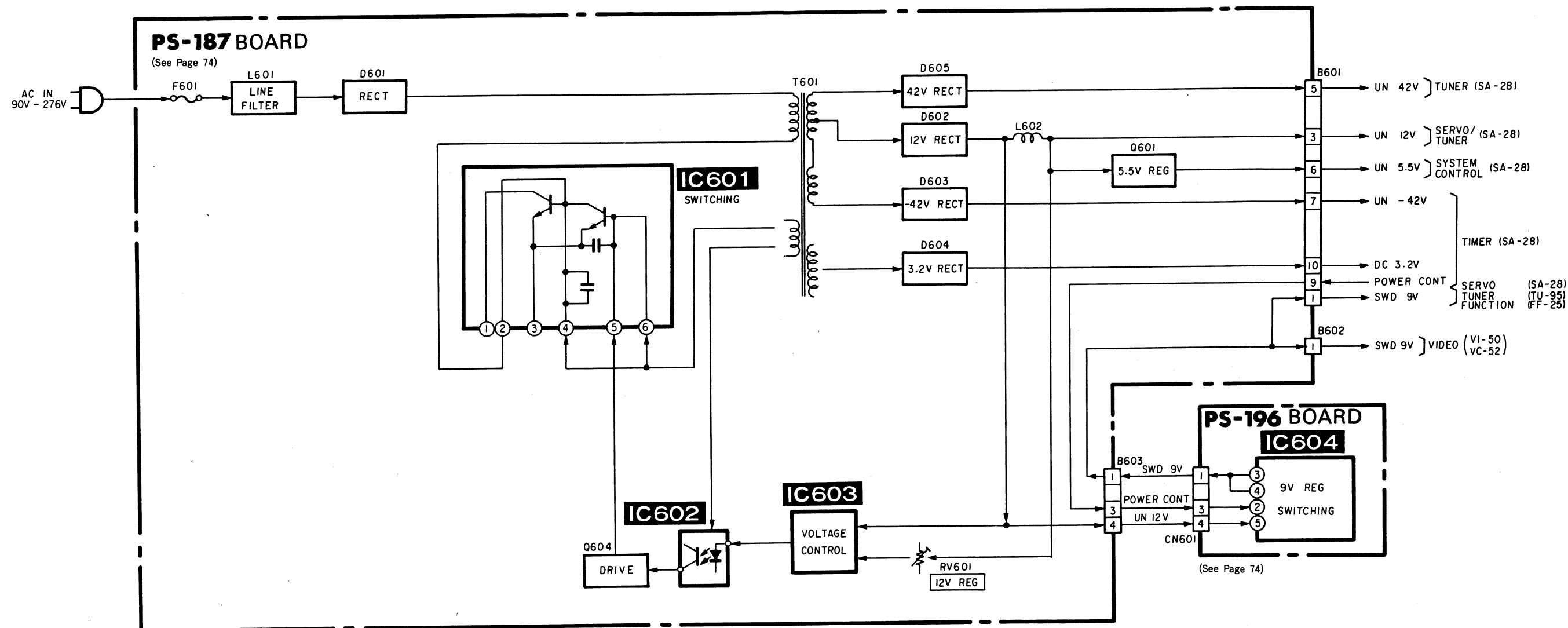


3-11. TUNER BLOCK DIAGRAM

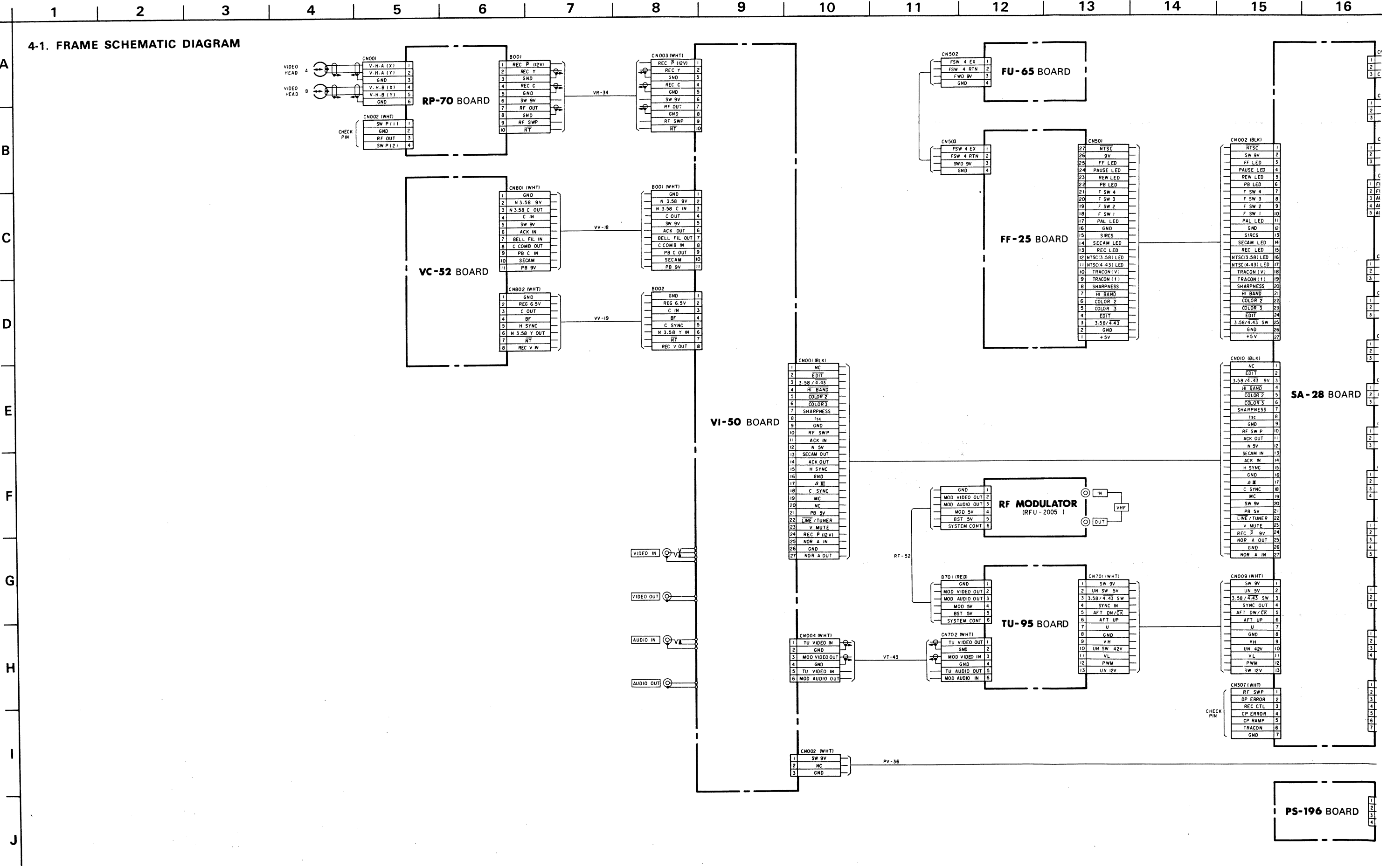


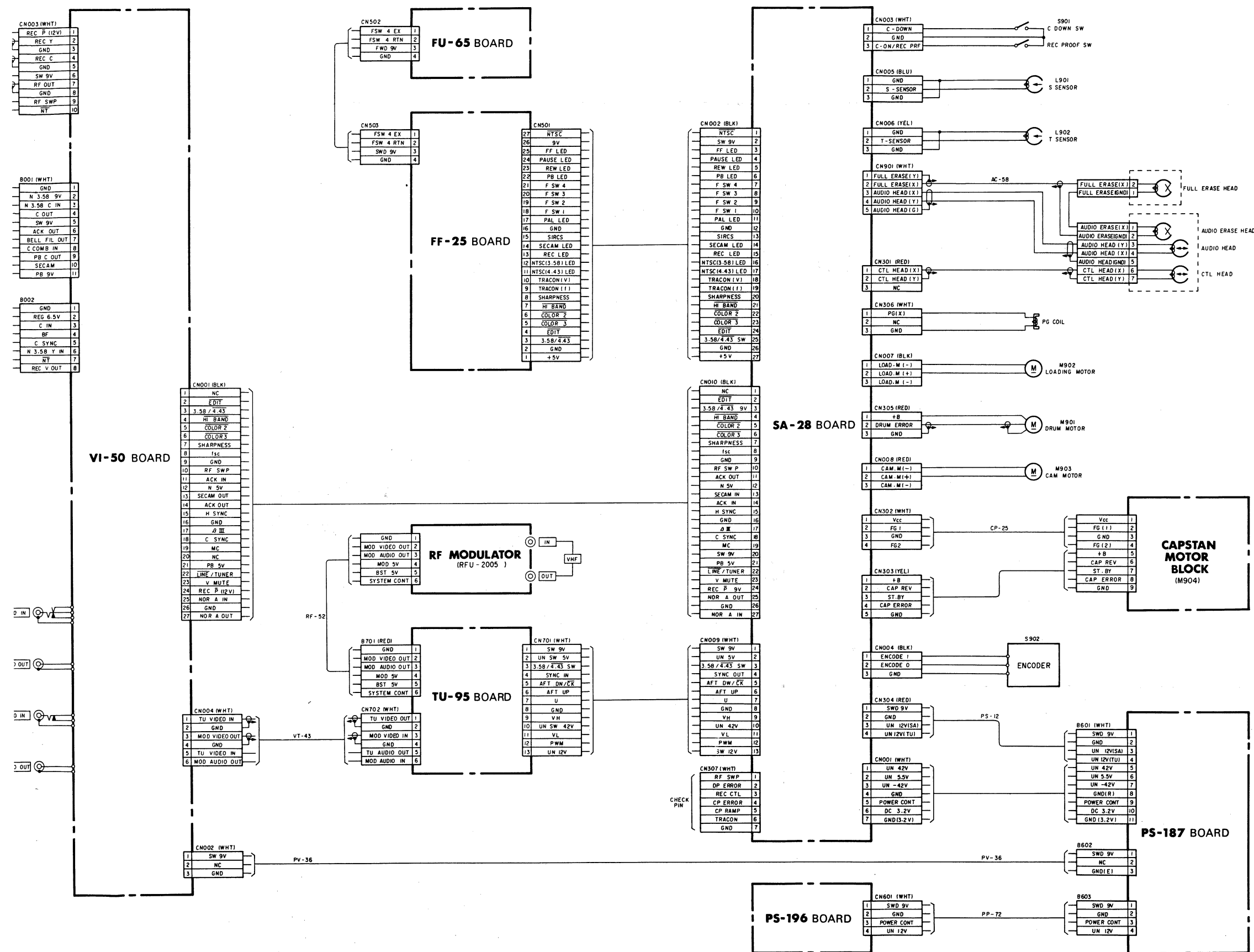


3-12. POWER BLOCK DIAGRAM



PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS





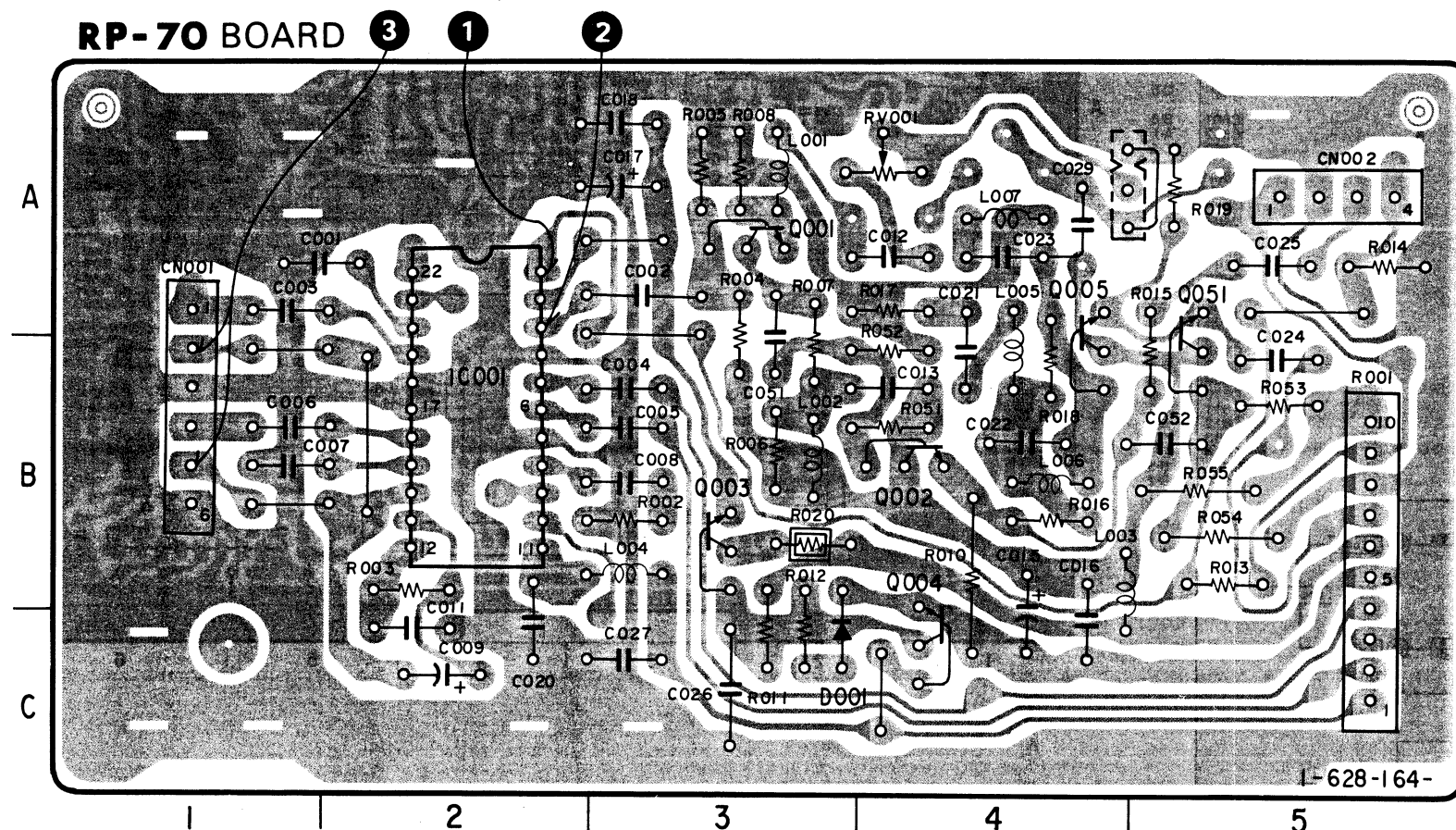
4-2. PRINTED WIRING BOARDS AND SCHEMATIC DIAGRAMS

RP-70 (HEAD AMP) PRINTED WIRING BOARD

— Ref. No. RP-70 BOARD: 1000 series —

RP-70 BOARD

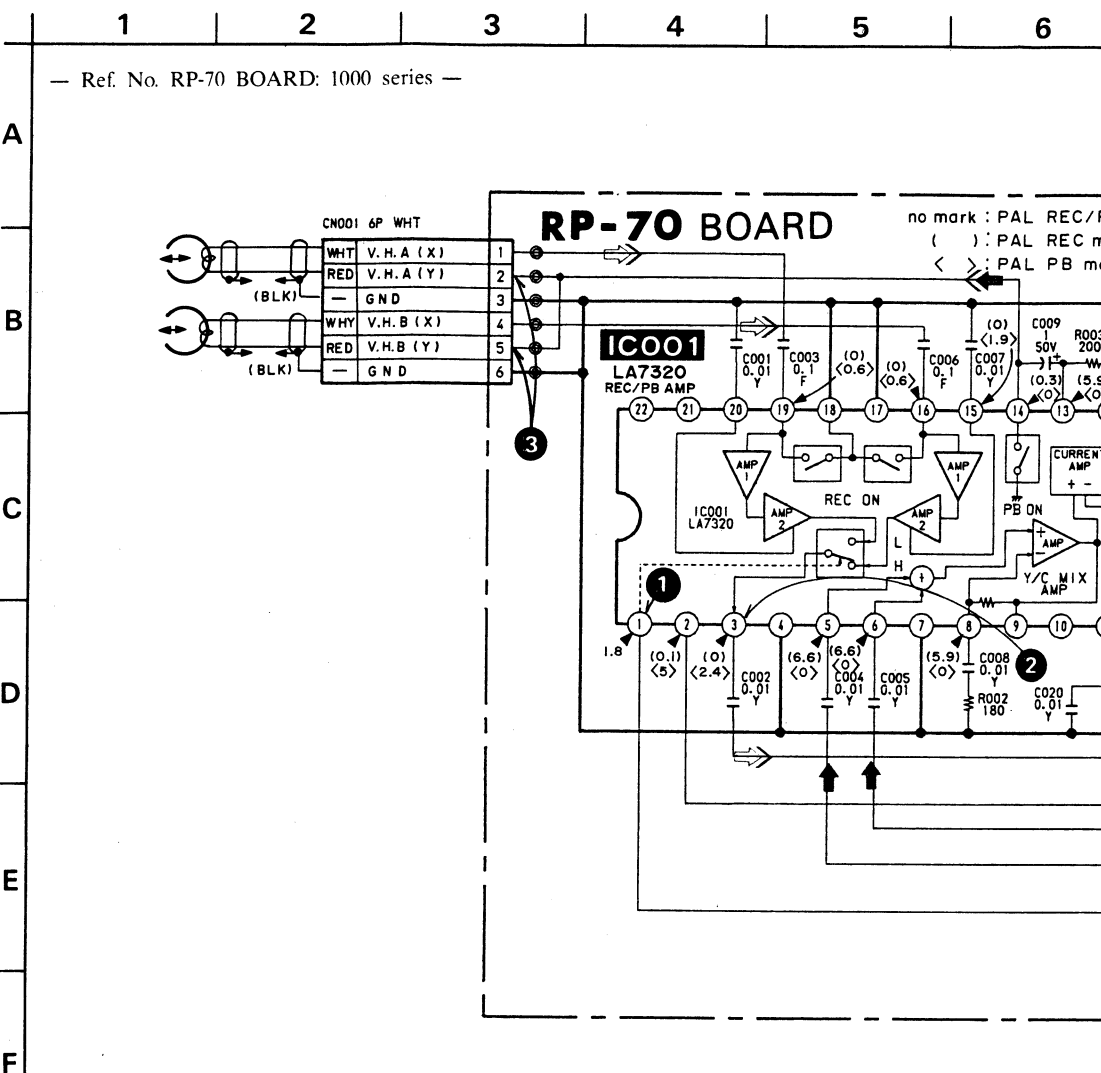
B001 B-5
CN001 A-1
CN002 A-5
D001 B-3
IC001 B-2
Q001 A-3
Q002 B-4
Q003 B-3
Q004 B-4
Q005 B-4
Q051 A-5
RV001 A-4



Note (Printed Wiring Board)

- : indicates a lead wire mounted on the component side.
- : indicates a lead wire mounted on the printed side.
- ⊗ : Through hole.
- : Pattern from the side which enables seeing.
- The ● number is the reference number in the waveform diagram.
- Digital transistor (RP-70: Q004) transistor with resistors. Refer to the RP-70 board schematic diagram for digital transistor.

RP-70 (HEAD AMP) SCHEMATIC DIAGRAM

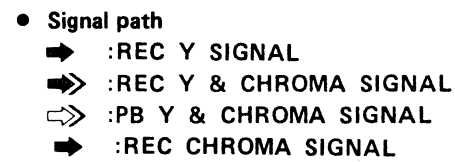


Note (Schematic Diagram)

- Caution when replacing chip parts. New parts must be attached after removal of chip. Be careful not to heat the minus side of tantalum capacitor, because it is damaged by the heat.
- All resistors are in ohms, 1/4W unless otherwise noted. kΩ : 1000Ω, MΩ : 1000kΩ.
- All variable and semi-fixed resistors have characteristics curve B unless otherwise noted.
- : nonflammable resistor.
- : fusible resistor.
- : panel designation.
- : adjustment for repair.
- : B+ line.
- - - : B- line.
- Voltages are dc with respect to ground unless otherwise noted.
- Readings are taken with a color-bar signal playback.
- Readings are taken with a digital multimeter (DC10MΩ).
- Voltage variations may be noted due to normal production tolerances.
- The ● number is the reference number in the waveform diagram.
- ⏚ indicates the I/O direction of B lines (+, -).

ts.
er removal of chip.
us side of tantalum capacitor,
eat.
less otherwise noted.
ors have characteristics curve B,

the number in the waveform
in of B lines (+, -).



1

3.2V p-p

2V

IC001 (1) REC/PB

2

IC001 (3) PB

V : 20mV/div
H : 0.1μsec/div

3

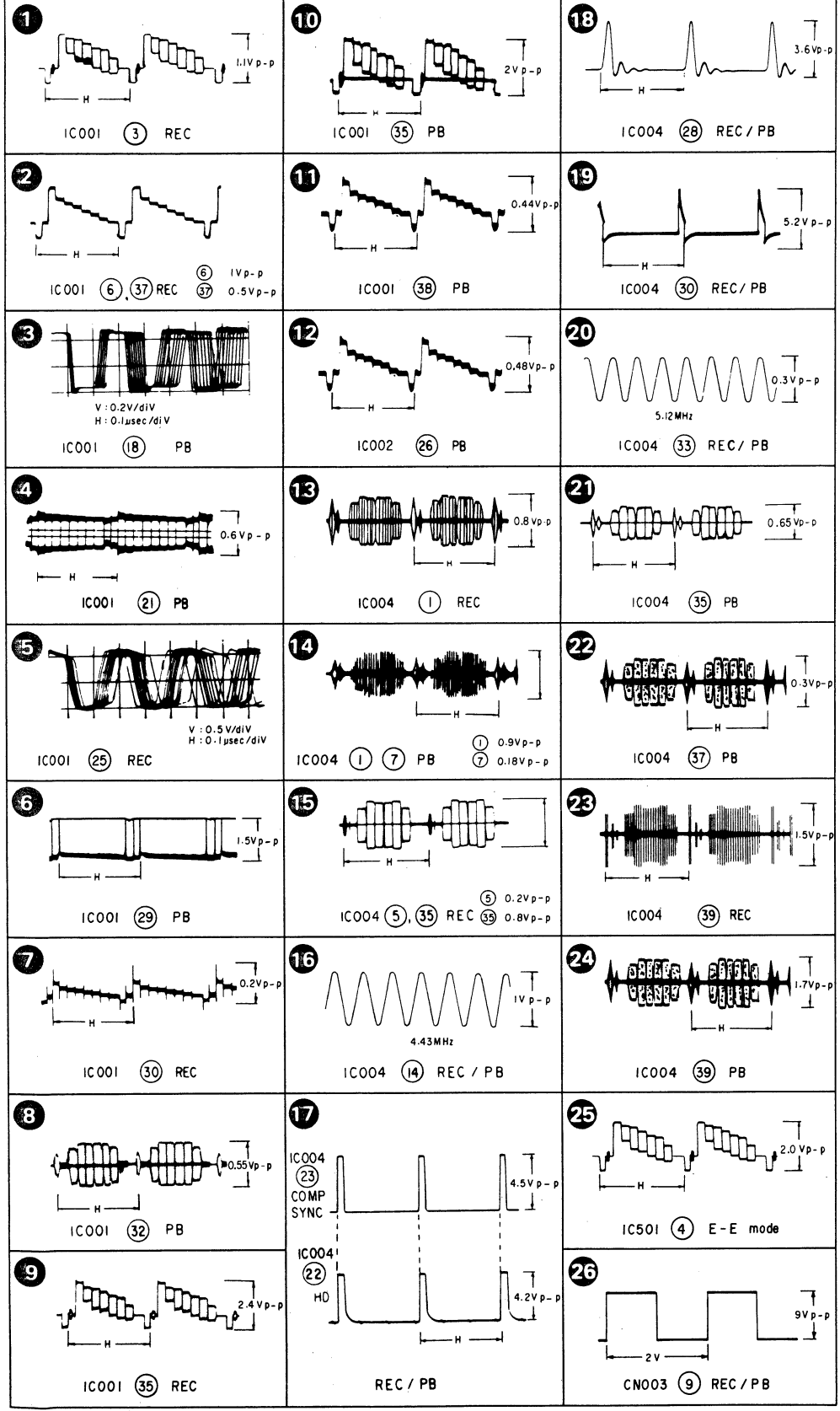
CN001 (2) (5) REC

V : 10mV/div
H : 0.1μsec/div

VI-50 (VIDEO), VC-52 (COMB FILTER) PRINTED WIRING BOARD

— Ref. No. VI-50 BOARD: 2000 series, VC-52 BOARD: 3000 series —

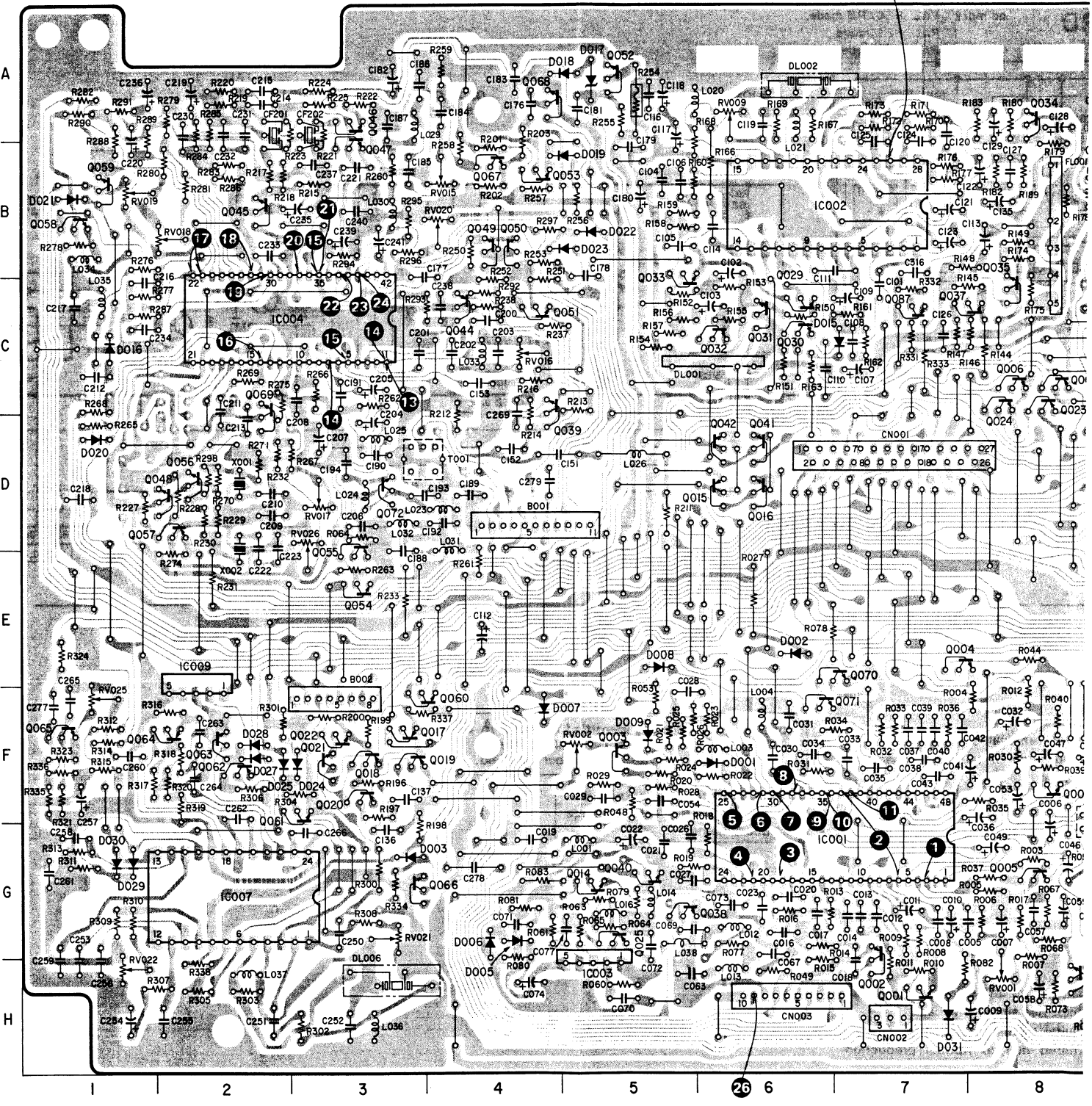
VI-50 BOARD

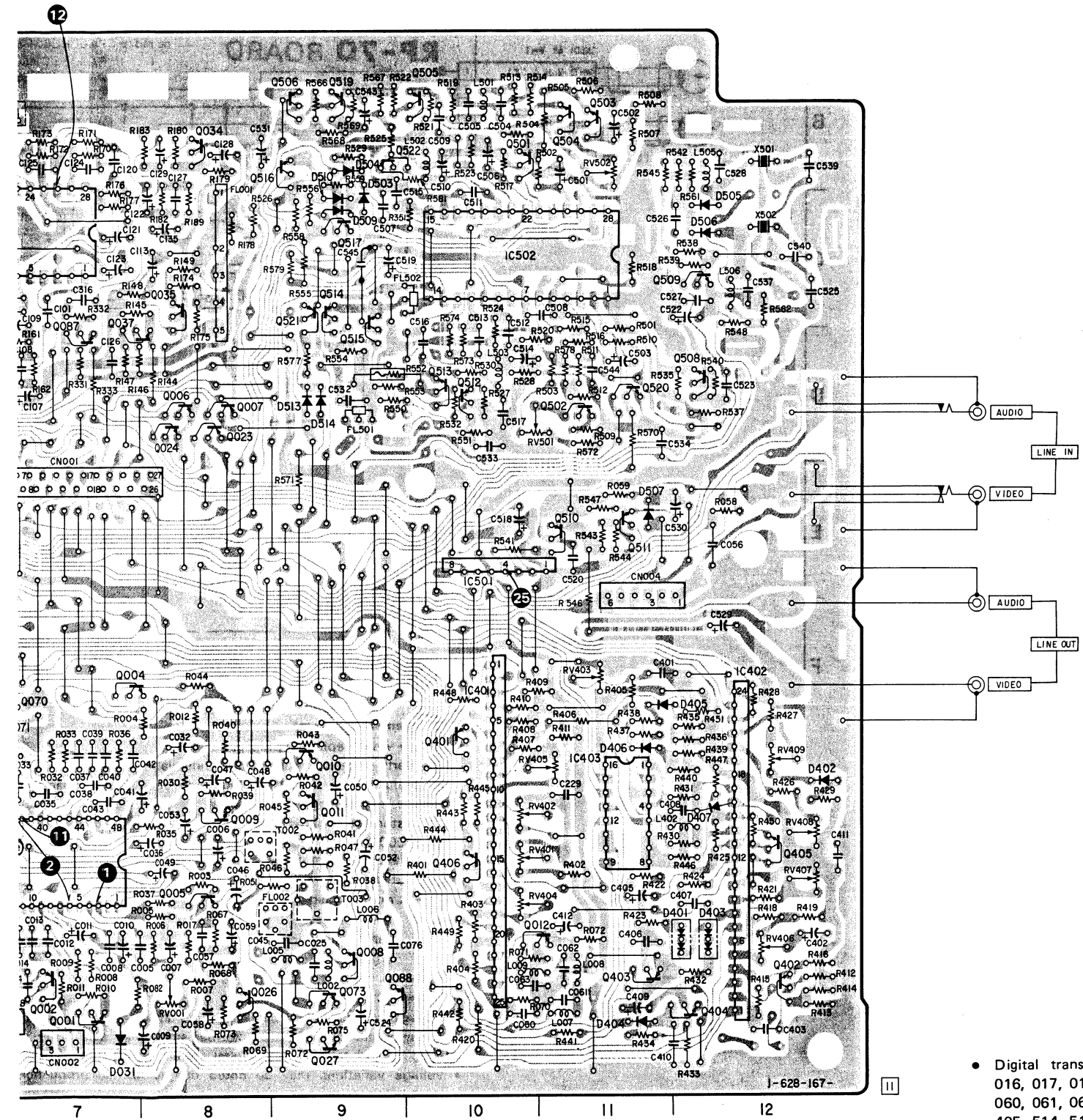


VI-50 BOARD

B001	D-4	Q041	D-6
B002	F-3	Q042	D-6
CN001	D-7	Q044	C-4
CN002	H-7	Q045	B-2
CN003	H-6	Q046	B-3
CN004	E-11	Q047	B-3
		Q048	D-2
		Q049	B-4
D001	F-6	Q050	B-4
D002	F-2	Q051	C-4
D003	G-3	Q052	A-5
D005	G-4	Q053	B-4
D006	G-4	Q054	E-3
D007	F-4	Q055	D-3
D008	F-5	Q056	D-2
D009	F-5	Q057	D-2
D015	C-7	Q058	B-1
D016	C-1	Q059	B-1
D017	A-5	Q060	F-4
D018	A-4	Q061	F-2
D019	B-5	Q062	F-2
D020	D-1	Q063	F-2
D021	B-1	Q064	F-1
D022	B-5	Q065	F-1
D023	B-5	Q066	G-3
D024	F-3	Q067	B-4
D025	F-2	Q068	C-2
D027	F-2	Q069	C-2
D028	F-2	Q070	E-7
D029	G-1	Q071	F-6
D030	G-1	Q072	D-3
D031	H-7	Q073	H-9
D401	G-12	Q074	C-7
D402	F-13	Q075	H-9
D403	G-12	Q076	F-10
D404	H-11	Q077	G-12
D405	F-11	Q078	G-11
D406	F-11	Q079	H-12
D407	F-12	Q080	G-12
D503	B-9	Q081	C-10
D504	A-9	Q082	A-10
D505	B-12	Q083	C-11
D506	B-12	Q084	A-11
D507	D-11	Q085	A-11
D509	B-9	Q086	A-10
D510	B-9	Q087	A-9
D513	C-9	Q088	C-12
D514	C-9	Q089	B-12
		Q090	D-11
		Q091	D-11
		Q092	C-10
		Q093	C-10
		Q094	C-9
		Q095	C-9
		Q096	B-9
		Q097	B-9
		Q098	A-9
		Q099	C-11
		Q100	C-9
IC001	G-6	RV001	H-8
IC002	B-6	RV002	F-5
IC003	H-5	RV009	A-6
IC004	C-2	RV015	B-4
IC007	G-2	RV016	C-4
IC009	E-2	RV017	D-3
IC401	E-10	RV018	B-2
IC402	E-12	RV019	B-1
IC403	F-11	RV020	B-4
IC501	D-10	RV021	G-3
IC502	B-10	RV022	H-1
		RV025	F-1
		RV026	D-3
		RV401	G-10
		RV402	F-11
		RV403	E-11
		RV404	G-10
		RV405	F-11
		RV406	G-12
		RV407	G-13
		RV408	F-13
		RV409	F-12
		RV501	C-11
		RV502	B-11
Q001	H-7		
Q002	H-7		
Q003	F-5		
Q004	E-7		
Q005	C-8		
Q006	C-8		
Q007	C-8		
Q008	G-9		
Q009	F-8		
Q010	F-8		
Q011	F-9		
Q012	G-12		
Q014	G-5		
Q015	D-6		
Q016	D-6		
Q017	F-3		
Q018	F-3		
Q019	F-3		
Q020	F-3		
Q021	F-3		
Q022	F-3		
Q023	C-8		
Q024	C-8		
Q025	G-4		
Q026	H-8		
Q027	H-9		
Q029	C-6		
Q030	C-6		
Q031	C-6		
Q032	C-6		
Q033	B-5		
Q034	A-9		
Q035	C-8		
Q037	C-7		
Q038	G-4		
Q039	C-4		
Q040	G-4		

VI-50 BOARD

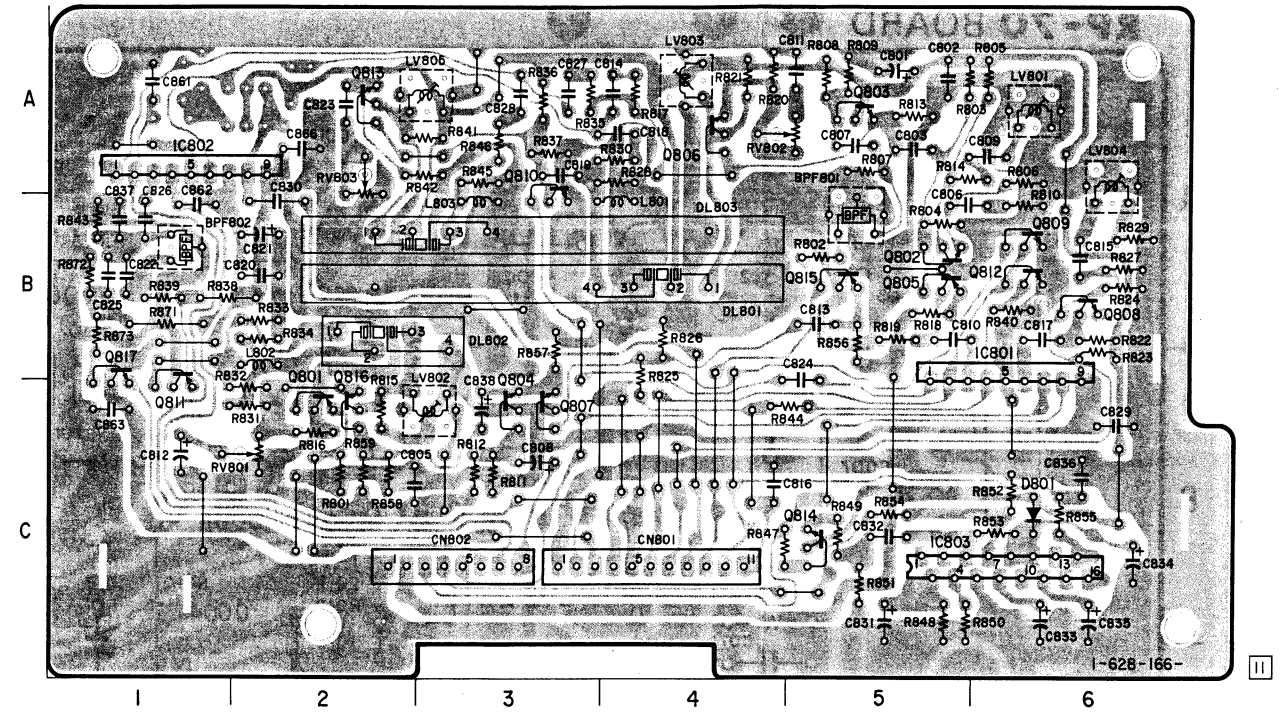




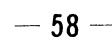
VC-52 BOARD

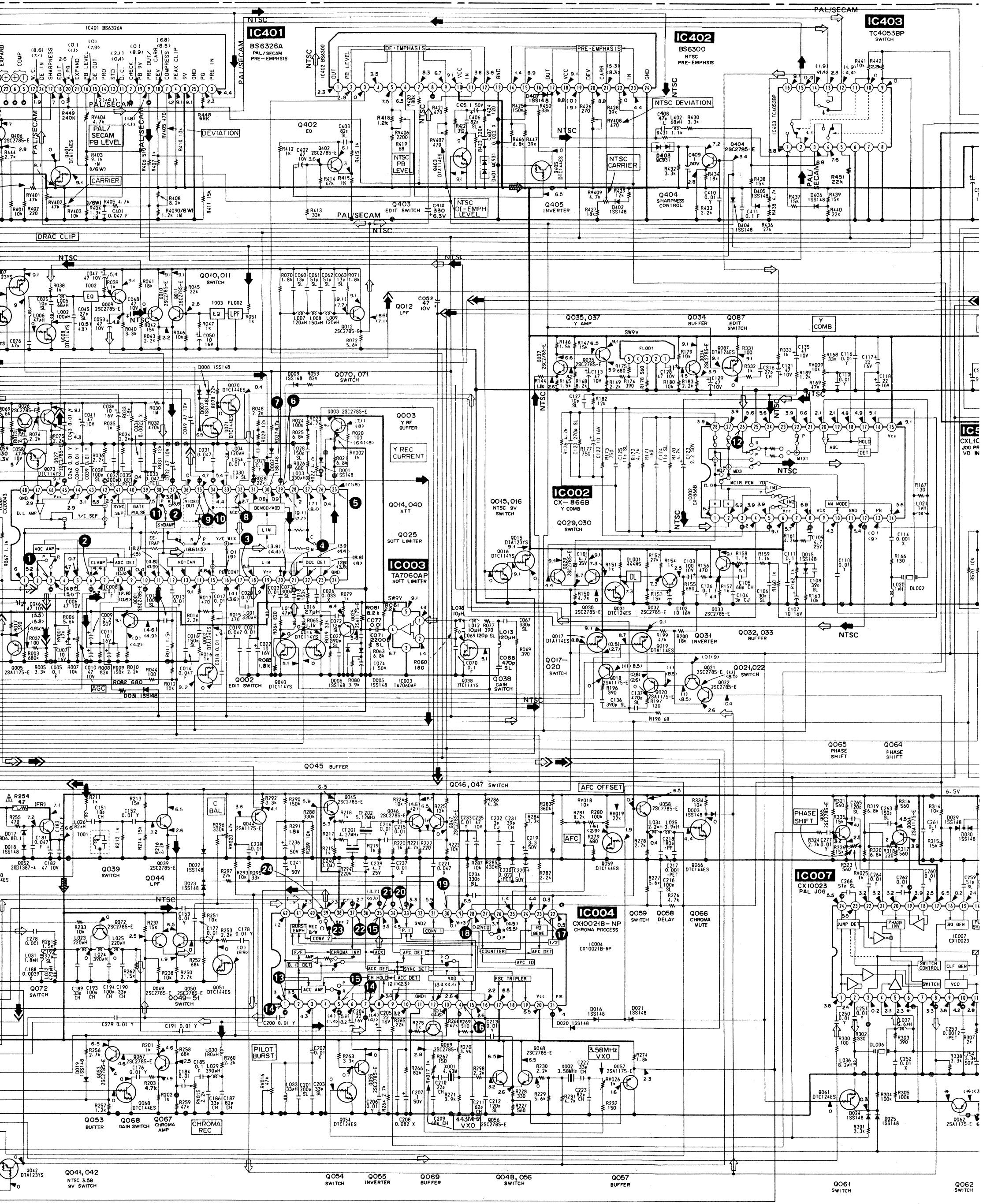
CN801	C-4
CN802	C-5
D801	C-6
IC801	B-6
IC802	A-1
IC803	C-5
LV801	A-6
LV802	C-3
LV803	A-4
LV804	A-6
LV805	A-2
Q801	C-2
Q802	B-5
Q803	A-5
Q804	C-3
Q805	B-5
Q806	A-4
Q807	C-3
Q808	B-6
Q809	B-6
Q810	A-3
Q811	C-1
Q812	B-12
Q813	A-2
Q814	C-5
Q815	B-5
Q816	C-2
Q817	B-1
RV801	C-2
RV802	A-4
RV803	A-2

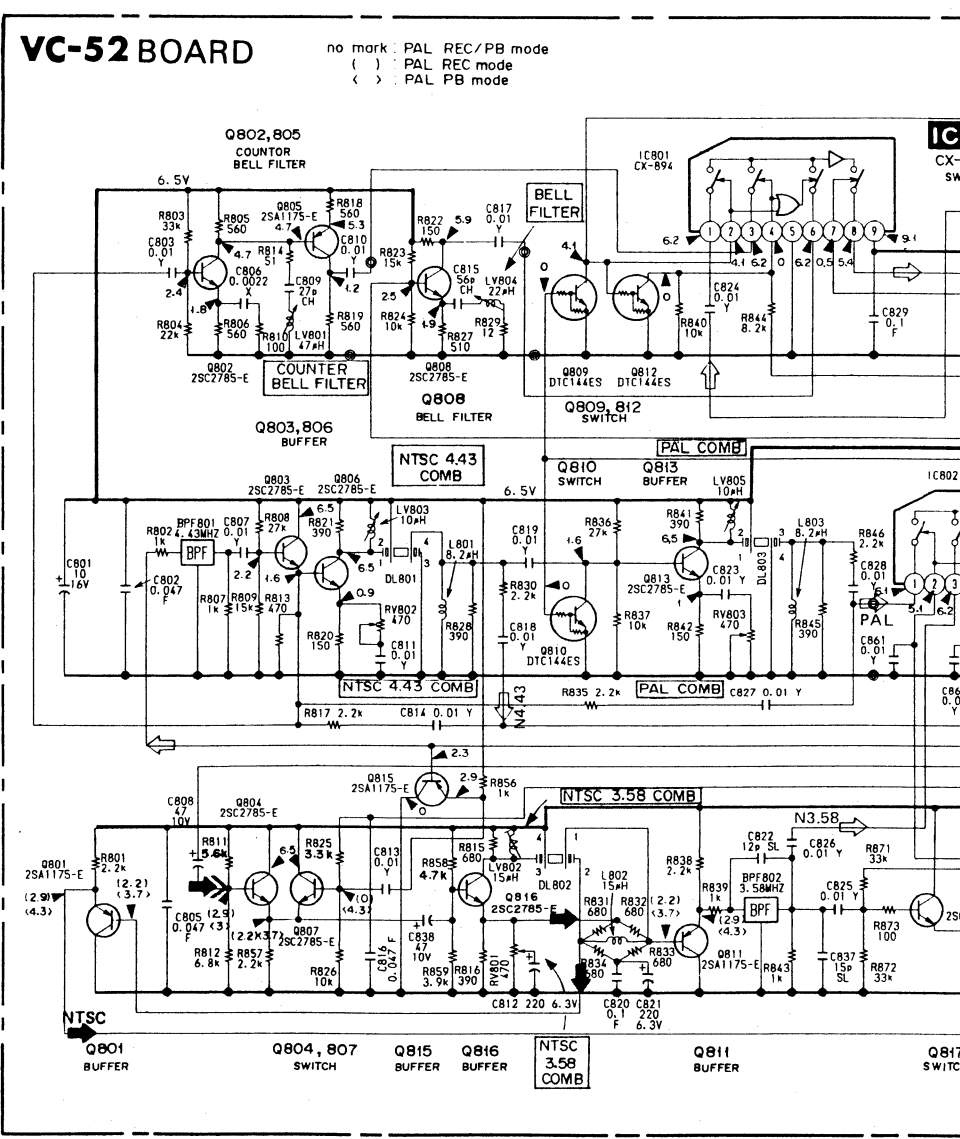
VC-52 BOARD

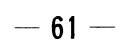
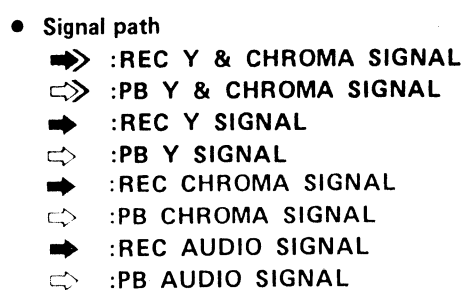


- Digital transistor (VI-50: Q002, 006, 007, 008, 014, 015, 016, 017, 019, 023, 024, 031, 040, 041, 042, 051, 054, 059, 060, 061, 063, 066, 068, 070, 071, 073, 087, 088, 401, 403, 405, 514, 515, 516, 517, 520, VC-52: Q809, 810, 812) transistor with resistors.
Refer to the VI-50, VC-52 boards schematic diagram for digital transistor.



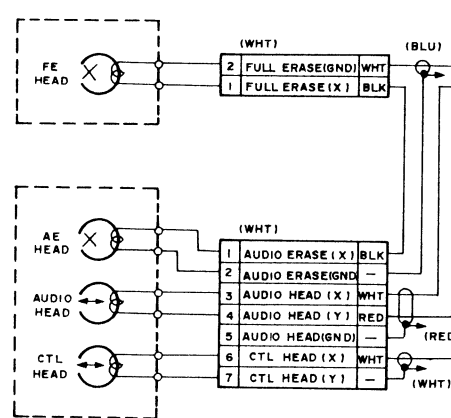






SA-28 (SERVO, SYSTEM CONTROL, MOTOR DRIVE, AUDIO, TIMER) SCHEMATIC DIAGRAM

— Ref. No. SA-28 BOARD: 4000 series —

A
B
C
D
E
F
G
H
I
J
K
L
M
N
O

SA-28 BOARD

no mark : PAL REC / PB mode
 () : PAL REC mode
 < > : PAL PB mode
 * : can not be measured

TO
VI-50 BOARD
CN001
(See Page 57)

TO
TU-95 BOARD
CN701
(See Page 74)

CHECK PIN

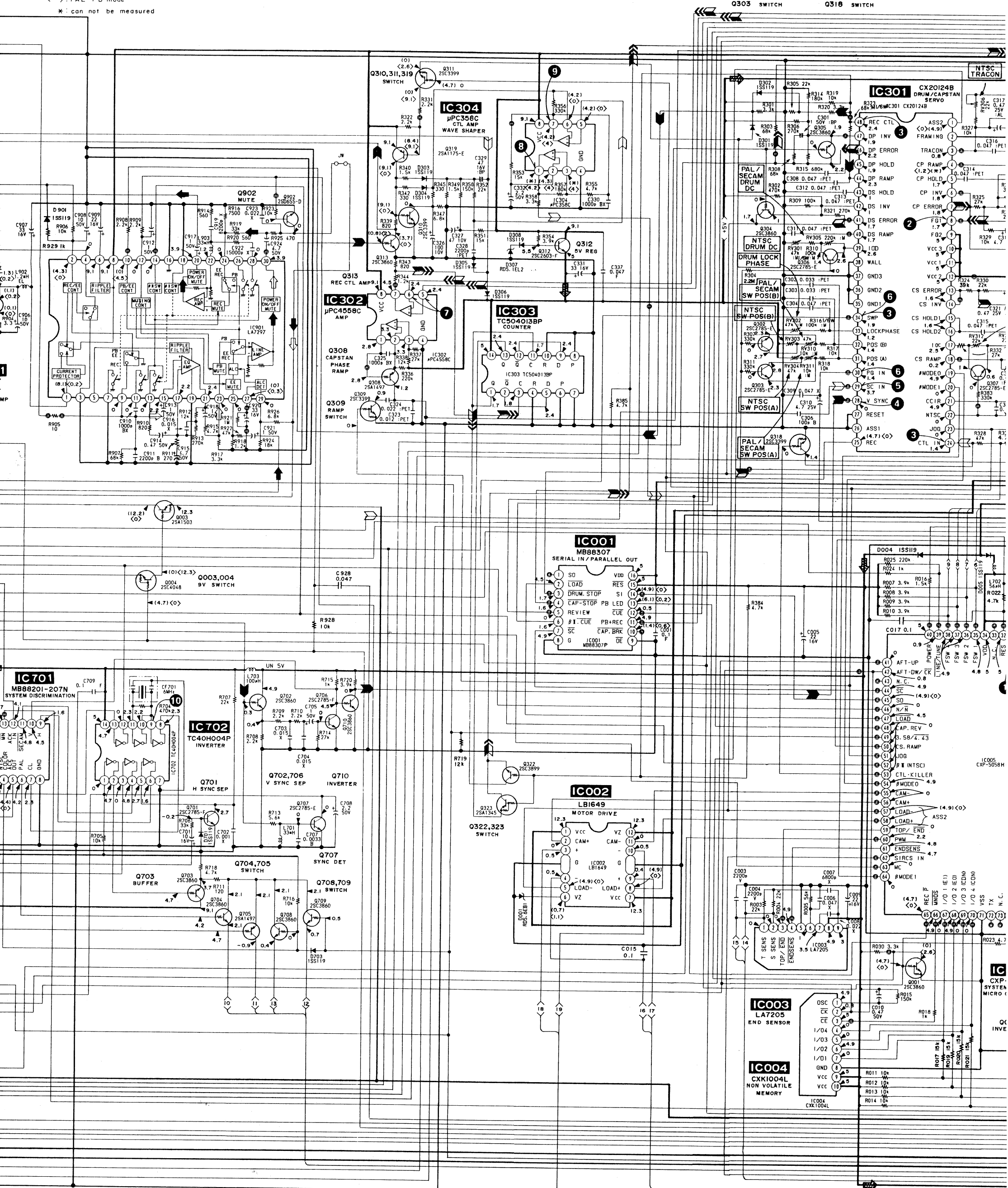
SA-28

no mark : PAL REC / PB mode

() : PAL REC mode

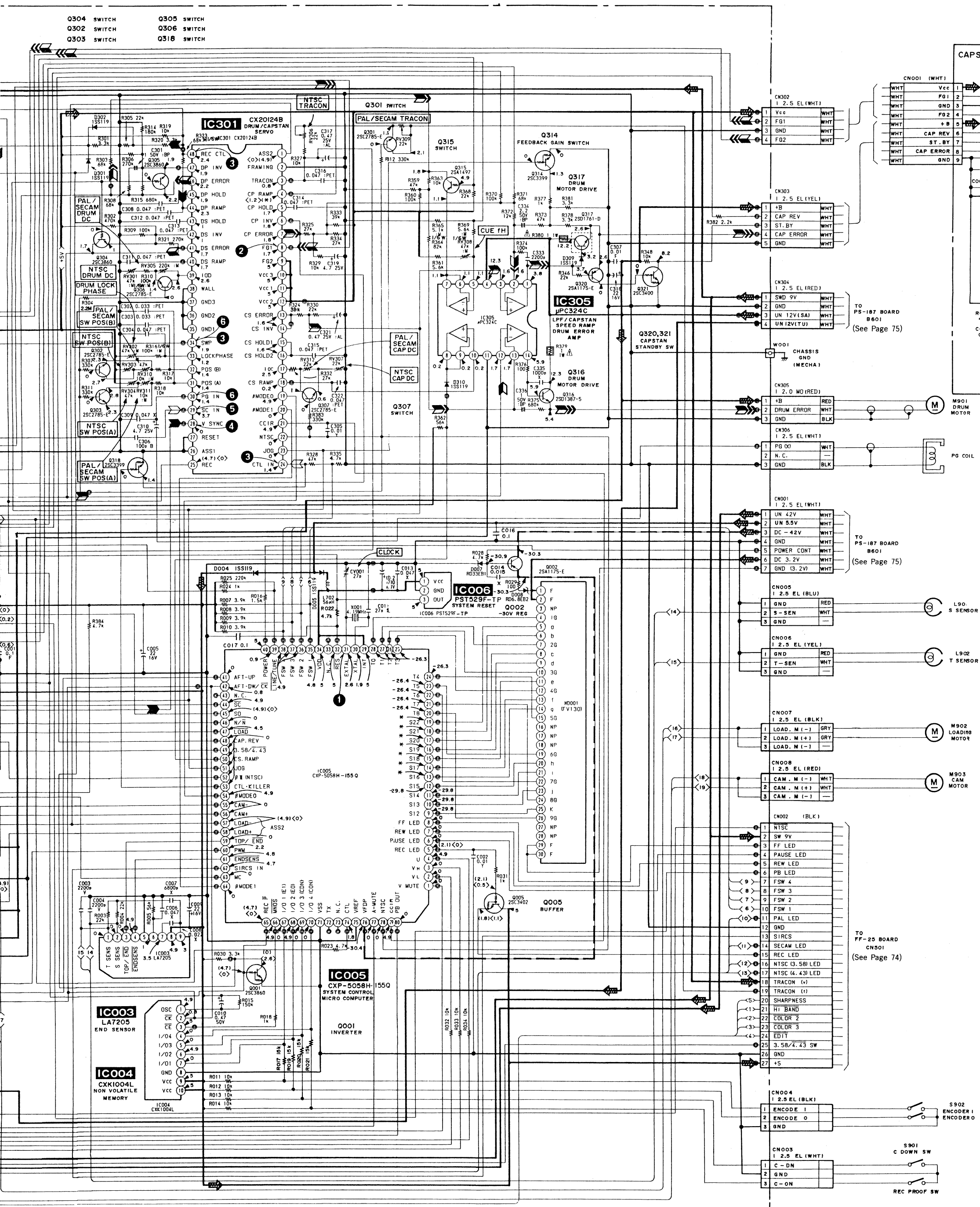
< > : PAL PB mode

* : can not be measured

Q304 SWITCH
Q302 SWITCH
Q303 SWITCHQ305 SWITCH
Q306 SWITCH
Q318 SWITCH

Q304 SWITCH
Q302 SWITCH
Q303 SWITCH

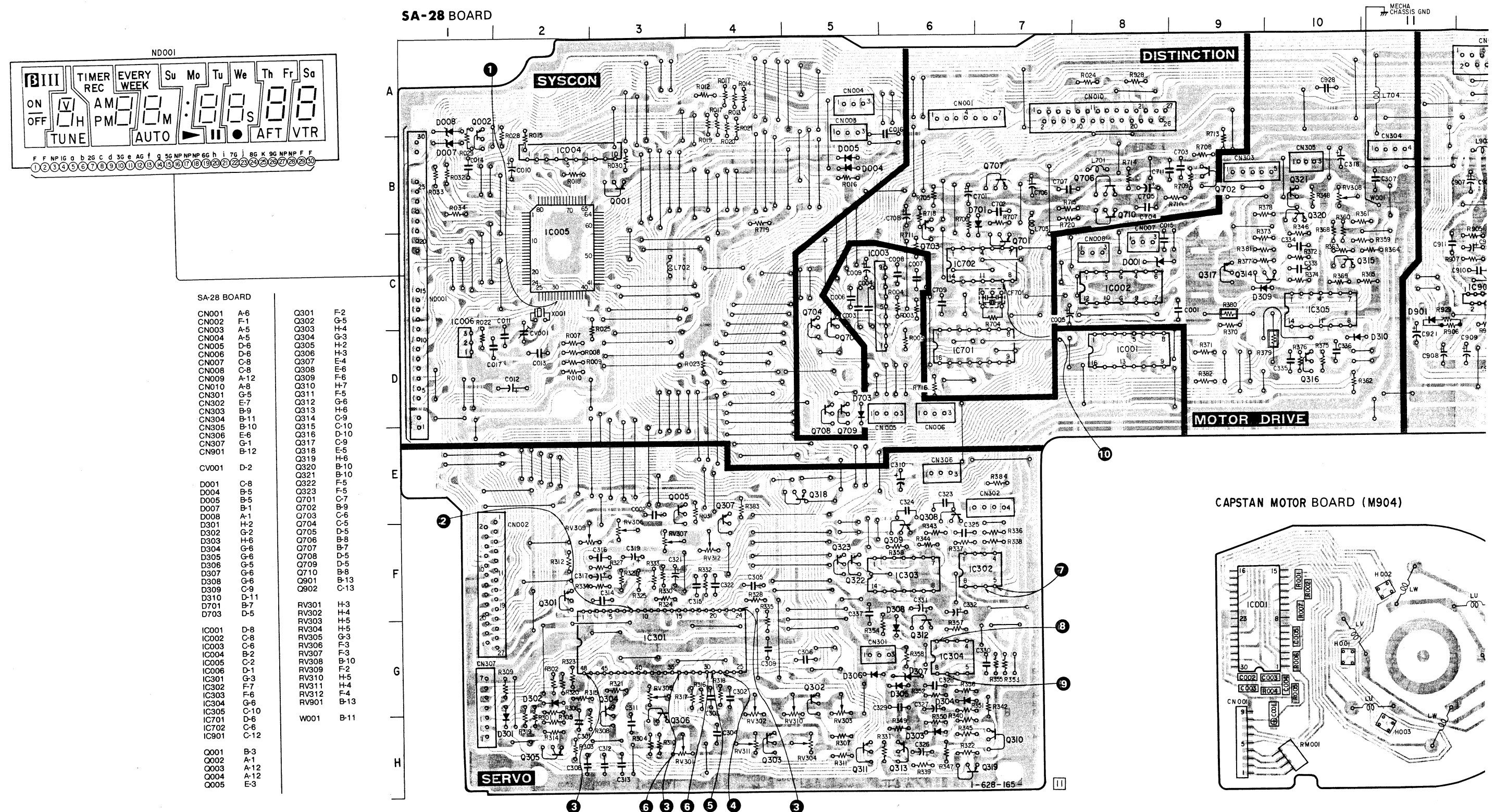
Q305 SWITCH
Q306 SWITCH
Q318 SWITCH



➡ :REC AUDIO SIGNAL
➡ :PB AUDIO SIGNAL

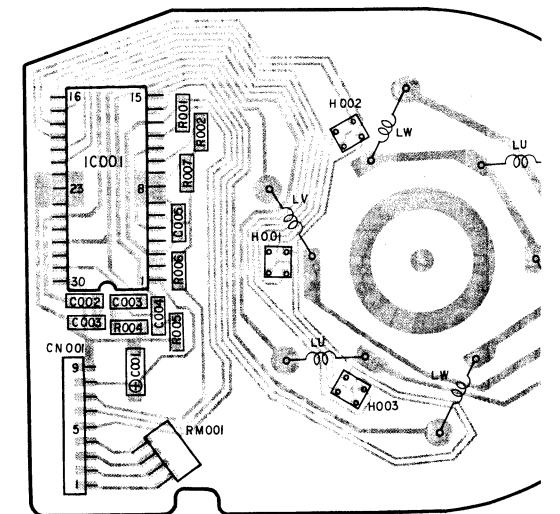
SA-28 (SERVO, SYSTEM CONTROL, MOTOR DRIVE, AUDIO, TIMER) PRINTED WIRING BOARD

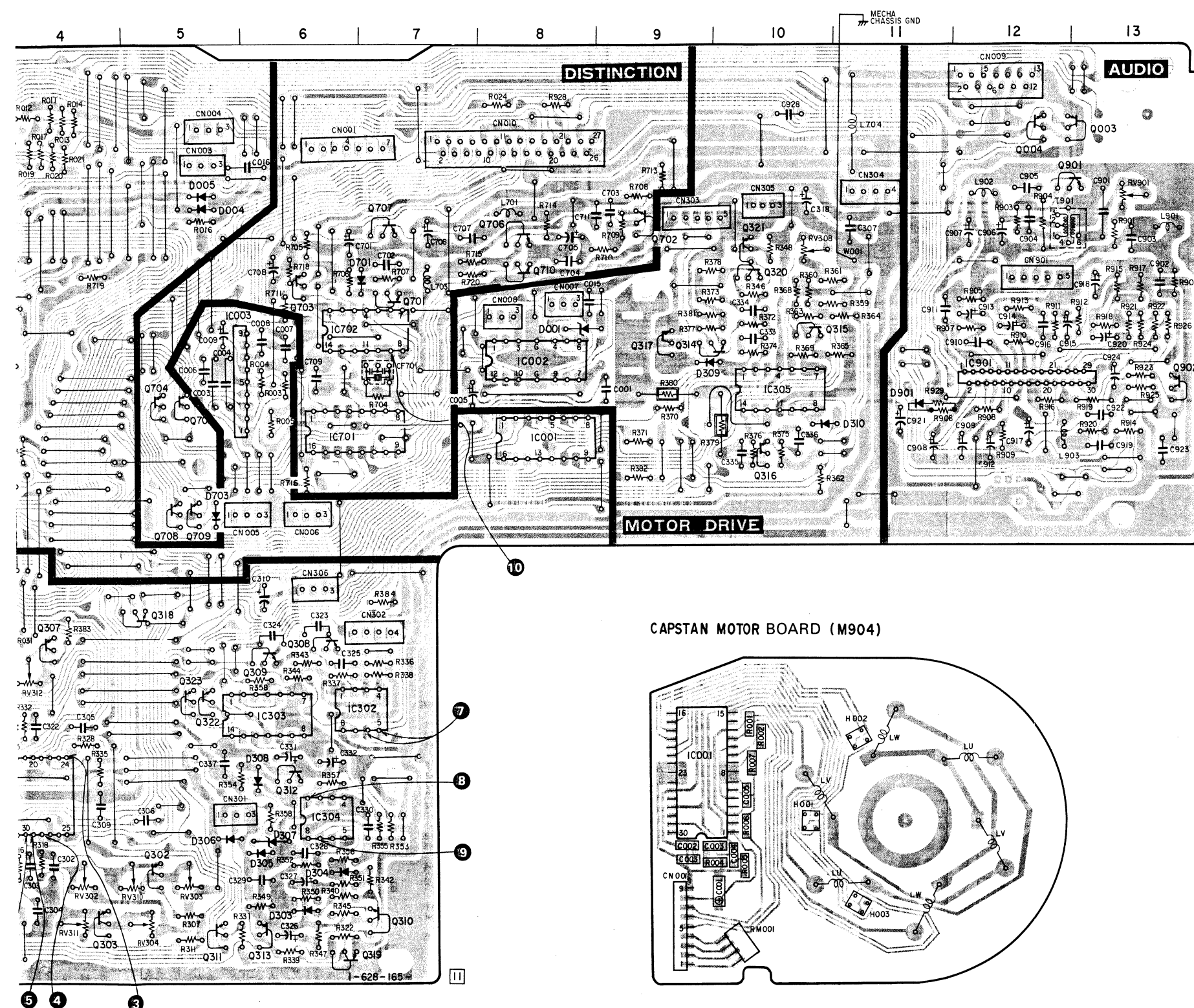
— Ref. No. SA-28 BOARD: 4000 series —



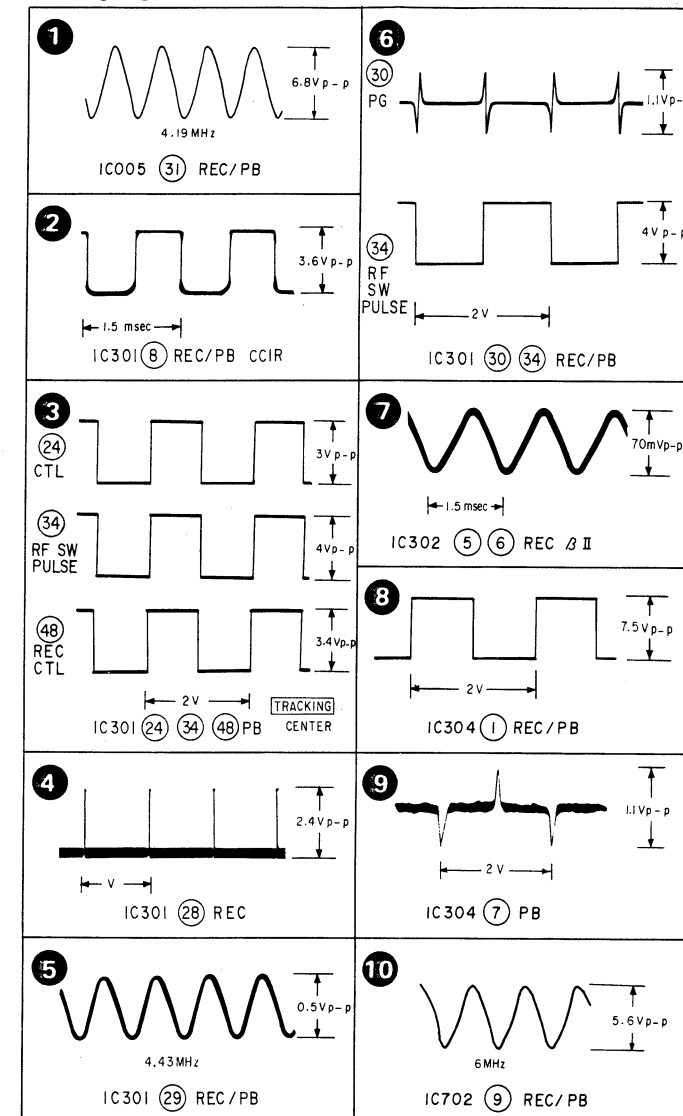
- Digital transistor (SA-28: Q001, 003, 004, 005, 304, 305, 308, 309, 310, 311, 313, 314, 315, 318, 321, 322, 323, 702, 703, 704, 705, 706, 708, 709) transistor with resistors. Refer to the SA-28 board schematic diagram for digital transistor.

CAPSTAN MOTOR BOARD (M904)





SA-28 BOARD



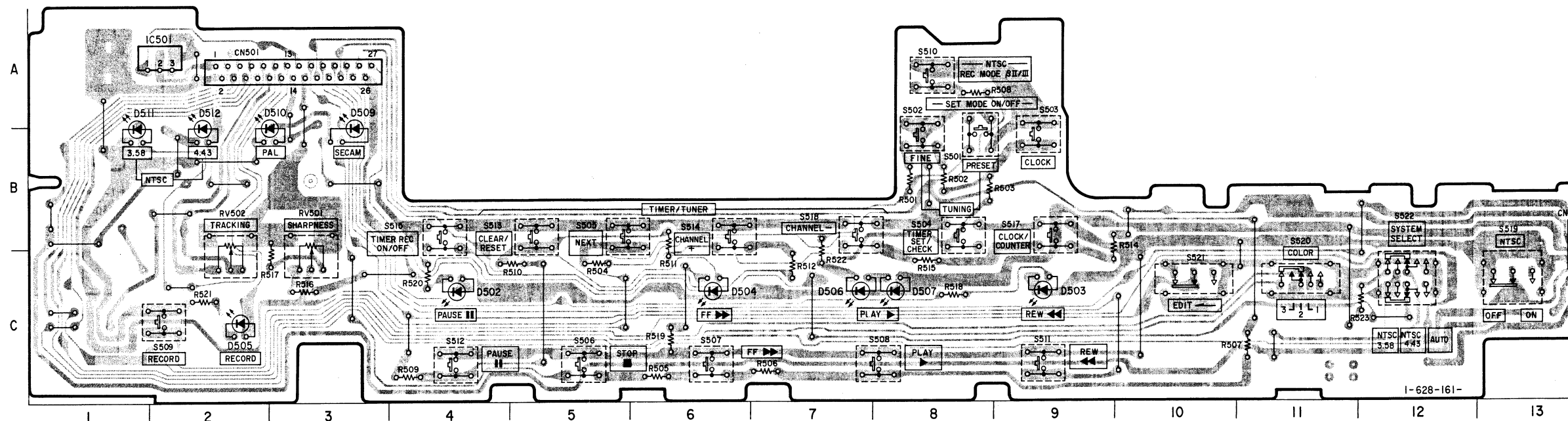
TU-95 (TUNER), FF-25 (FUNCTION SWITCH), FU-65 (FUNCTION SWITCH), PS-187 (POWER), PS-196 (POWER) PRINTED WIRING BOARD

— Ref. No. TU-95 BOARD: 5000 series, PS-187 BOARD: 6000 series, PS-196 BOARD: 7000 series, FF-25 BOARD: 8000 series, FU-65 BOARD: 4000 series —

FF-25 BOARD

CN501	A-2
CN503	B-12
D502	C-4
D503	C-9
D504	C-6
D505	C-2
D506	C-7
D507	C-8
D509	A-3
D510	A-3
D511	A-1
D512	A-2
IC501	A-2
RV501	B-1
RV502	B-3

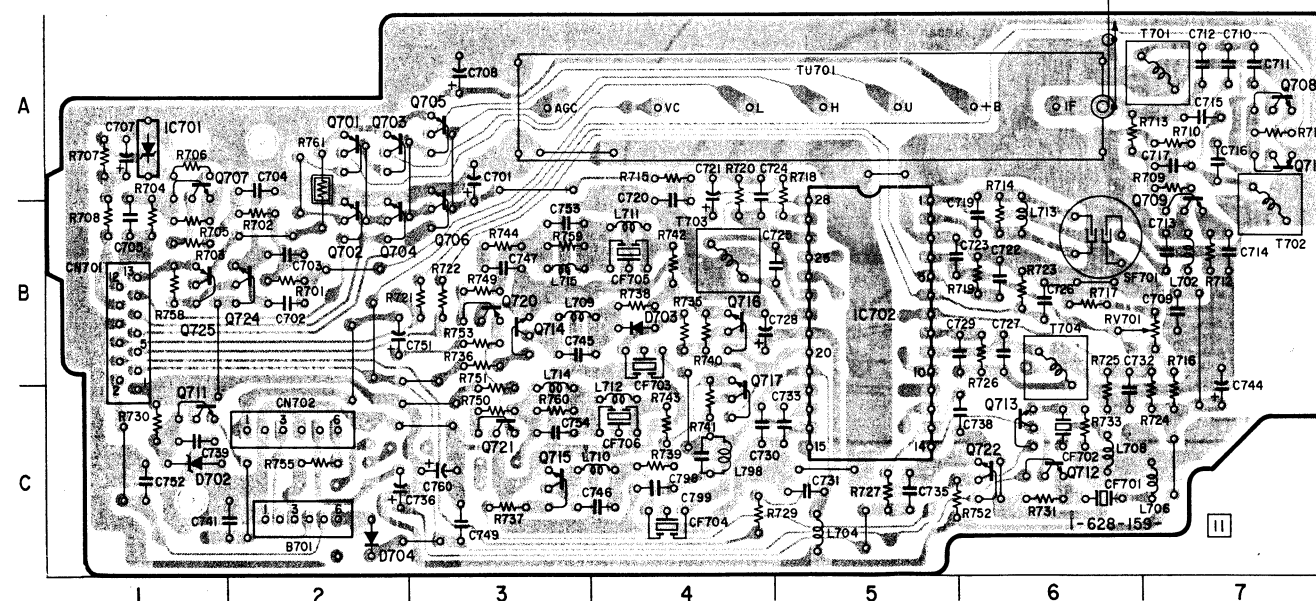
FF-25 BOARD



TU-95 BOARD

B701	C-2
CN701	B-1
CN702	C-2
D702	C-1
D703	B-4
D704	C-2
IC701	A-1
IC702	B-5
Q701	A-2
Q702	B-2
Q703	A-2
Q704	B-2
Q705	A-3
Q706	B-3
Q707	A-1
Q708	A-7
Q709	B-7
Q710	A-7
Q711	C-1
Q712	C-6
Q713	C-6
Q714	B-3
Q715	C-3
Q716	B-4
Q717	C-4
Q720	B-3
Q721	C-3
Q722	C-6
Q724	B-2
Q725	B-1
RV701	B-6

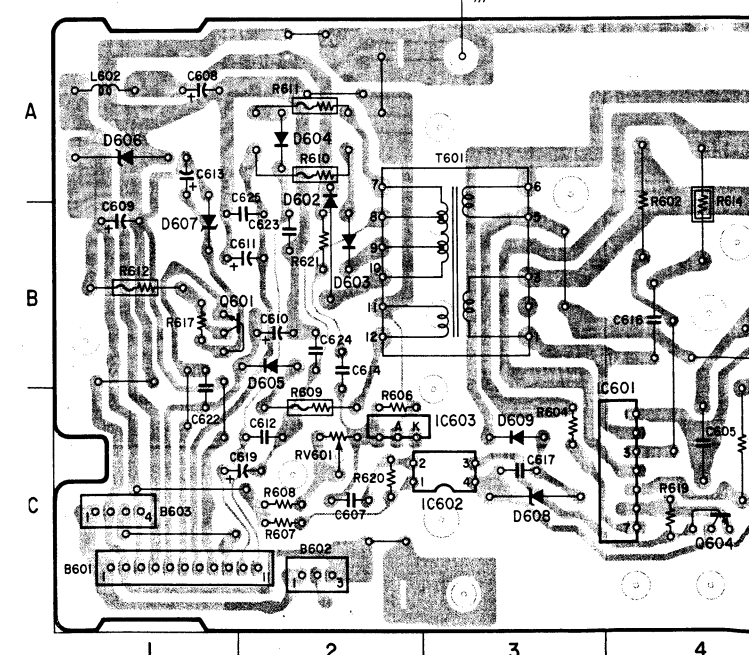
TU-95 BOARD



PS-187 BOARD

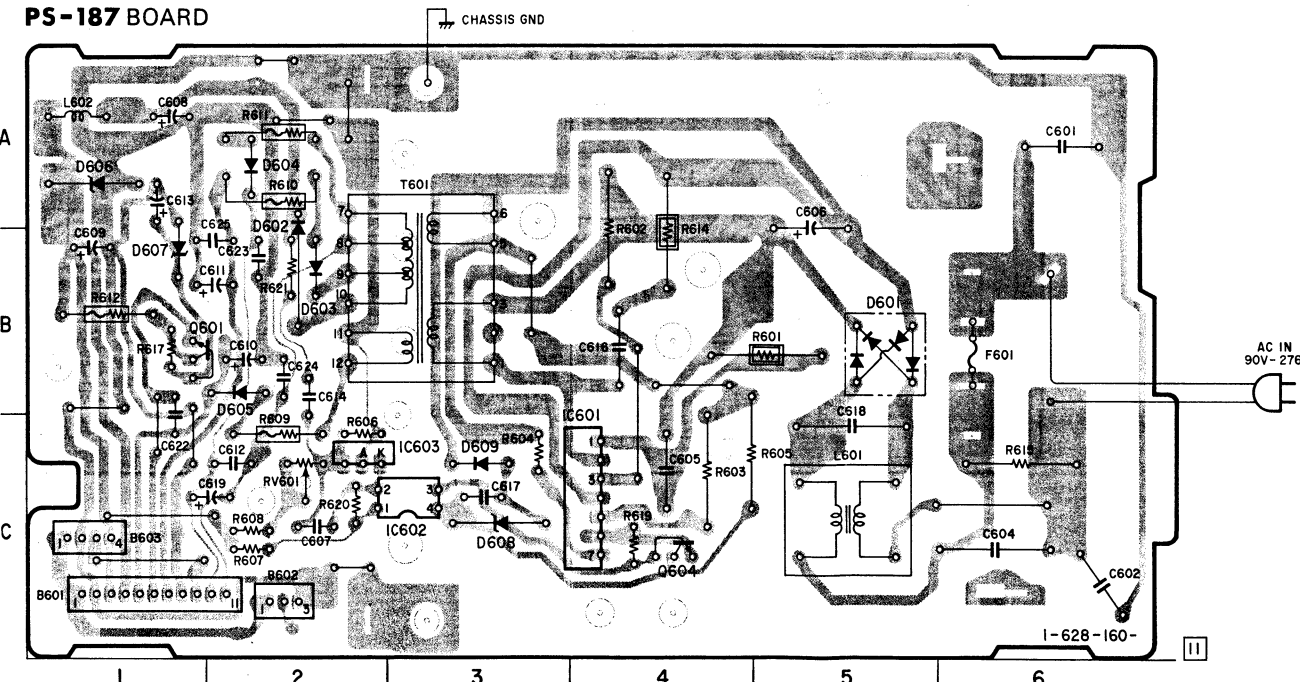
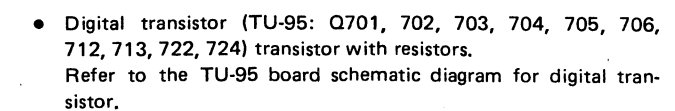
B601	C-1
B602	C-2
B603	C-1
D601	B-5
D602	A-2
D603	B-2
D604	A-2
D605	B-2
D606	A-1
D607	B-1
D608	C-3
D609	C-3
IC601	C-4
IC602	C-3
IC603	C-3
Q601	B-1
Q604	C-4
RV601	C-2

PS-187 BOARD

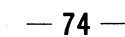


TUNER, POWER, FUNCTION SWITCH

series —



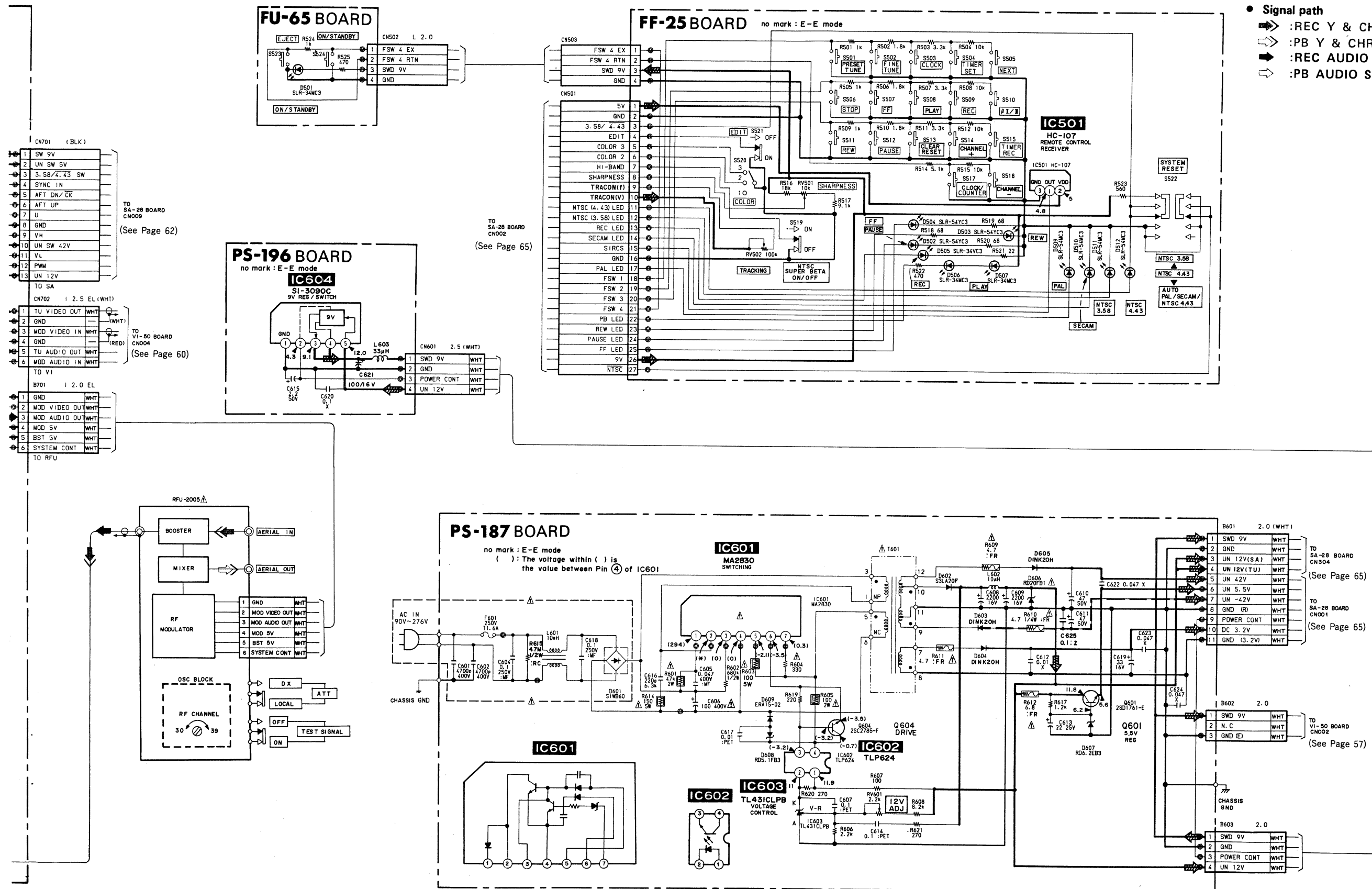
— Ref. No. TU-95 BOARD: 5000 series, PS-187 BOARD: 6000 series, PS-196 BOARD: 7000 series, FF-25 BOARD: 8000 series, FU-65 BOARD: 4000 series —



SCHEMATIC DIAGRAM

9 10 11 12 13 14 15 16 17 18 19 20 21 22

4000 series —

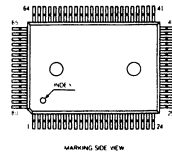


4-3. SEMICONDUCTORS

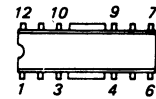
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TA7060AP



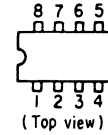
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LB1649



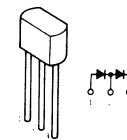
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μPC4558C



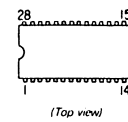
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2SD655-E



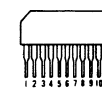
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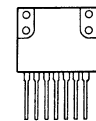
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CX20015
CXL1008P
LA7205



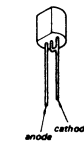
CXK1004L



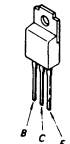
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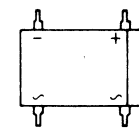
μPC5740



2SD1761-E



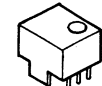
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CX-894



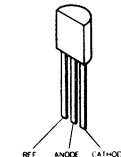
HC107



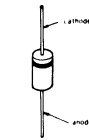
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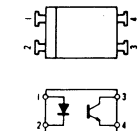
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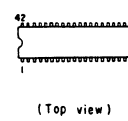
11E2
1N4531
EQA02-07A
HZ5.6E-B
RD33E-B1
RD5.1E-L1
RD5.1E-L2
RD5.1F-B2
RD5.6E-B1
RD5.6E-B2
RD5.6E-N3
RD6.2E-B2
RD6.2E-B3
RD6.8E-B2
RD6.8E-L2



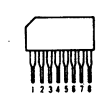
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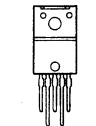
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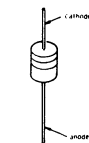
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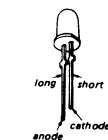
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2SA1115-F
2SA1346
2SA1348
2SA1497
2SA1503
2SA1511
2SC2603-E
2SC2669
2SC3400
2SC3860
2SC3899



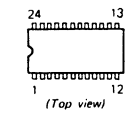
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1SS148



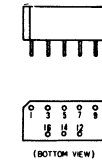
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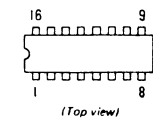
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LA7311



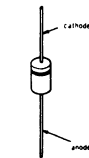
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MB88307P
MB88201-207N



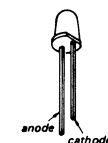
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2SC2785
2SC2785-F



DINK20H-TA
EBQ01-20
S3LA20F



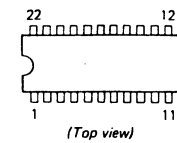
SLR34MC-3
SLR34VC-3



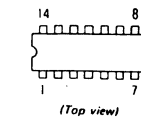
CX20124B
CX20043



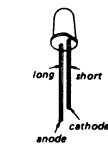
LA7320



TC504013BP
TC40H004P
μPC324C



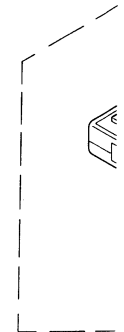
TLY113AP



NOTE:
• -XX, - they m the origi
• The cor part ar number

5-1. FRC

(1)



No.	Par
1	X-3
2	X-3
3	*1-3
4	1-3
5	3-3
6	4-3

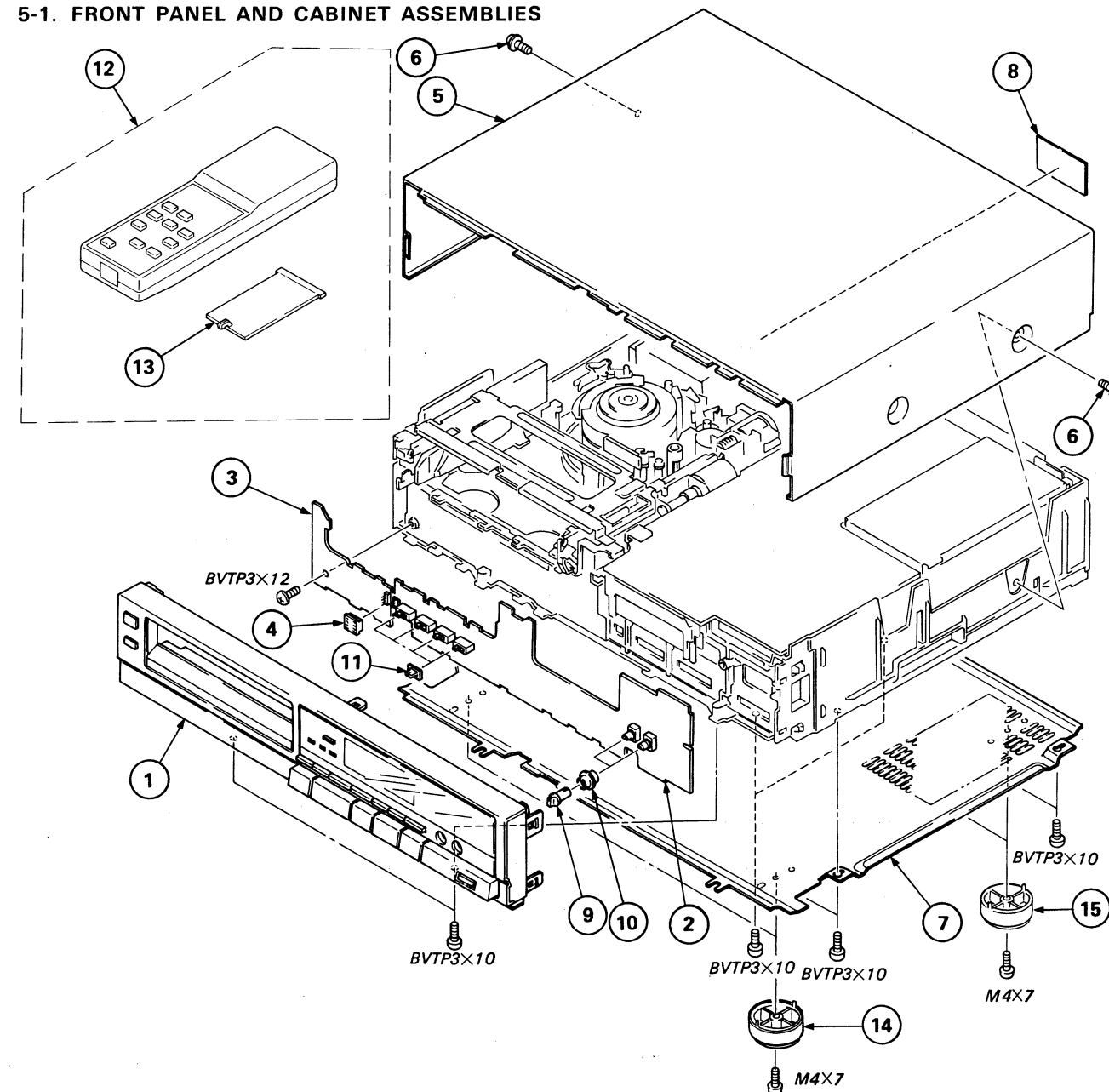
SECTION 5
EXPLODED VIEWS

NOTE:

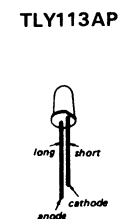
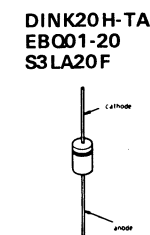
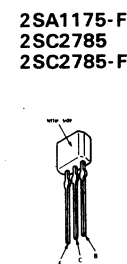
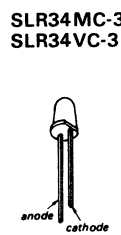
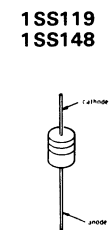
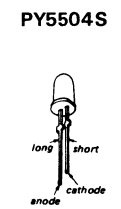
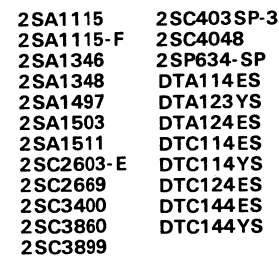
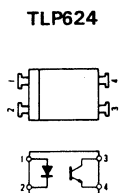
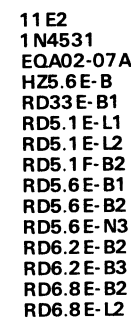
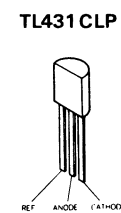
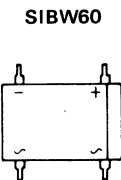
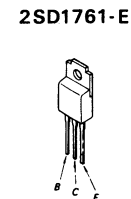
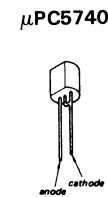
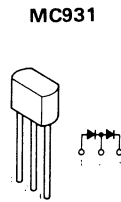
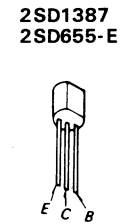
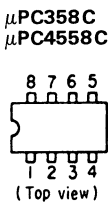
- —XX, —X mean standardized parts, so they may have some differences from the original one.
- The construction parts of an assembled part are indicated with a collation number in the remark column.
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- The mechanical parts with no reference number in the exploded views are not supplied.

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

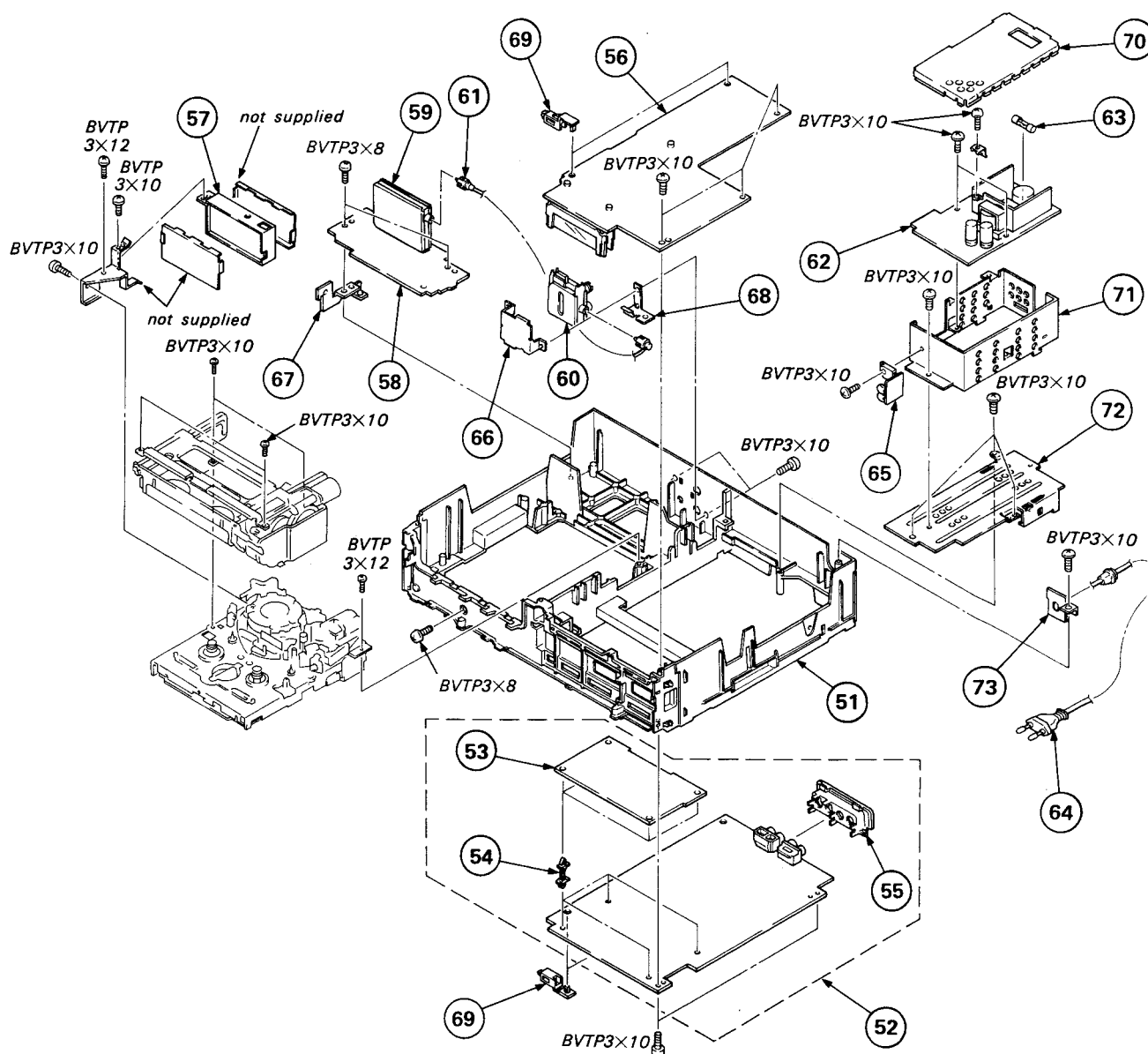
5-1. FRONT PANEL AND CABINET ASSEMBLIES



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
1	X-3716-113-1	PANEL ASSY, FRONT (BLACK)		7	*3-723-185-01	PLATE, BOTTOM	
	X-3716-114-1	PANEL ASSY, FRONT (SILVER)		8	*3-694-500-01	LABEL, MODEL NUMBER (NO.2)	
2	*1-628-161-11	FF-25 BOARD		9	3-721-550-11	KNOB, TRACK CONTROL	
3	*1-628-162-11	FU-65 BOARD		10	3-721-554-01	COLLAR, TRACK CONTROL VOLUME	
4	1-565-774-11	CONNECTOR, BOARD TO BOARD 4P		11	3-721-557-01	KNOB, SELECTION (BLACK)	
5	3-695-045-51	CASE, UPPER (BLACK)			3-721-557-11	KNOB, SELECTION (SILVER)	
	3-721-505-31	CASE, UPPER (SILVER)		12	1-463-845-22	REMOTE COMMANDER (RMT-158)	13
6	4-886-821-21	SCREW, M3 CASE STOPPER (BLACK)		13	3-716-159-01	BATTERY COVER	
	4-886-821-31	SCREW, M3 CASE STOPPER (SILVER)		14	X-3716-096-1	FOOT ASSY	
				15	X-3716-117-1	FOOT ASSY	



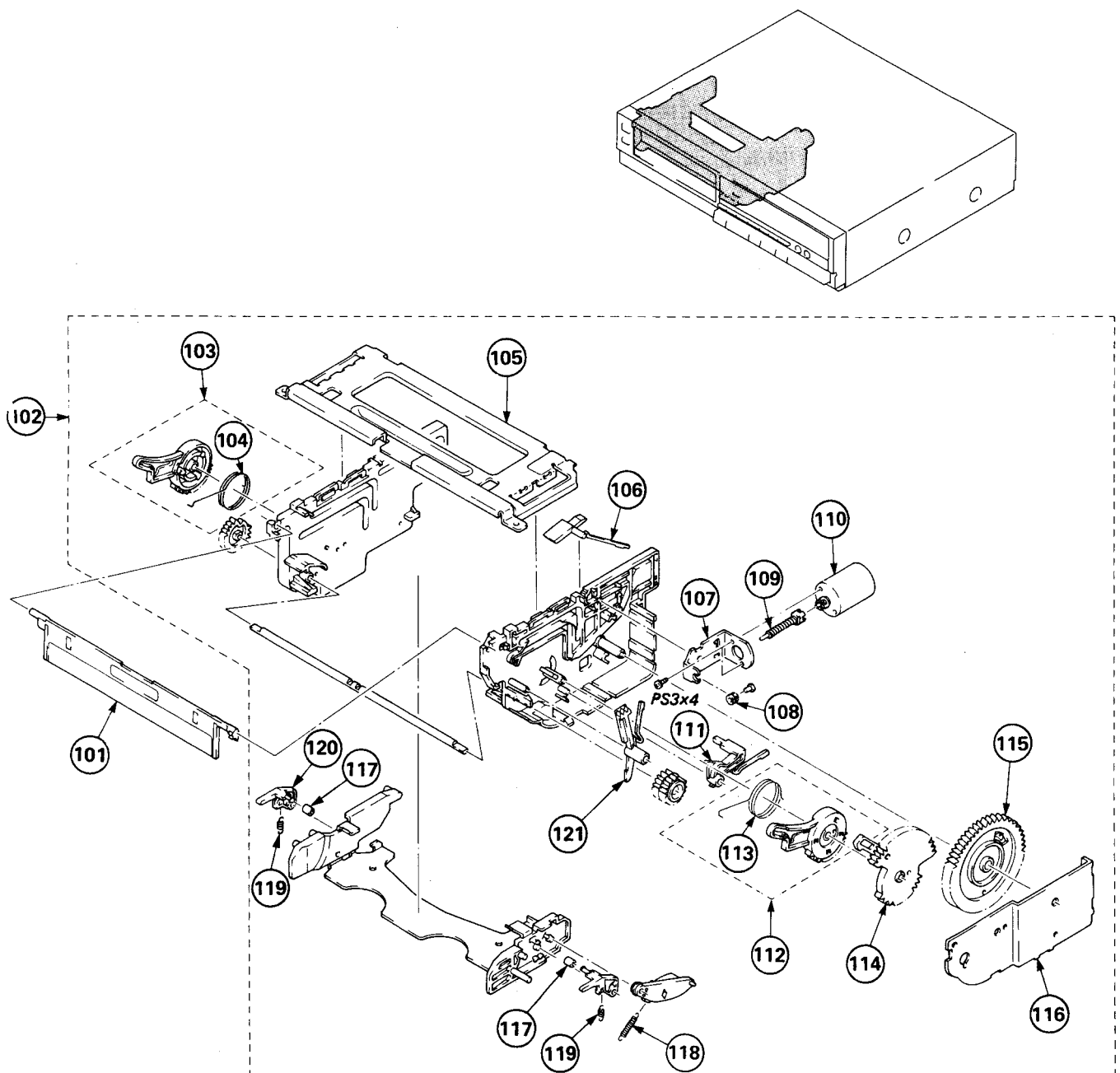
5-2. TUNER AND POWER ASSEMBLIES



No.	Part No.	Description
51	*3-723-186-01	FRAME, MOLD
52	*A-6711-986-A	VI-50 BOARD, COMPLETE
53	*A-6710-989-A	VC-52 BOARD, COMPLETE
54	*3-710-673-01	SUPPORT, PC BOARD
55	3-723-178-01	COVER, JACK
56	*A-6715-415-A	SA-28 BOARD, COMPLETE
57	*A-6725-638-A	RP-70 BOARD, COMPLETE
58	*A-6721-292-A	TU-95 BOARD, COMPLETE
59	⚠.1-463-848-11	TUNER, ET (BT-886A) (TU701)
60	⚠.1-466-044-11	MODULATOR, RF (RFU-2005)
61	1-555-400-00	CABLE, PIN
62	*A-6722-381-A	PS-187 BOARD, COMPLETE

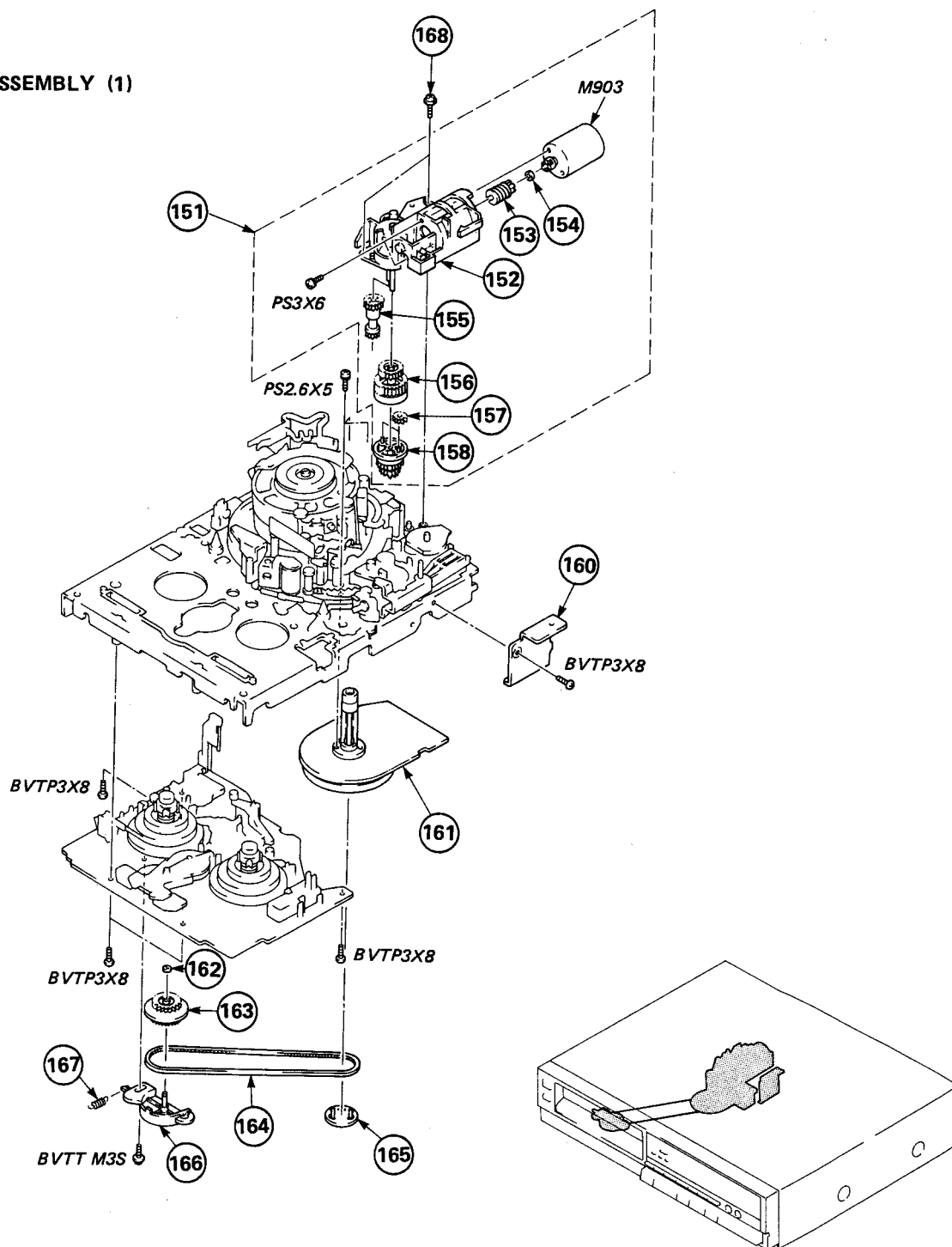
Remark	No.	Part No.	Description	Remark
53-55	63	⚠.1-532-259-00	FUSE, TIME-LAG (1.6A 250V)	
	64	⚠.1-551-908-71	CORD, POWER, EULO PLUG (2.5A 250V)	
	65	*1-628-163-11	PS-196 BOARD	
	66	*3-712-894-01	BRACKET	
	67	*3-729-409-11	BRACKET (LEFT)	
	68	*3-723-198-01	PLATE, GROUND, RF	
	69	*3-723-199-01	HINGE PC BOARD	
	70	*X-3716-119-1	LID ASSY, POWER	
	71	*3-723-183-01	CASE, POWER	
	72	*3-723-182-01	BRACKET, POWER	
	73	*3-723-188-01	BRACKET, AC	

5-3. FRONT LOADING ASSEMBLY



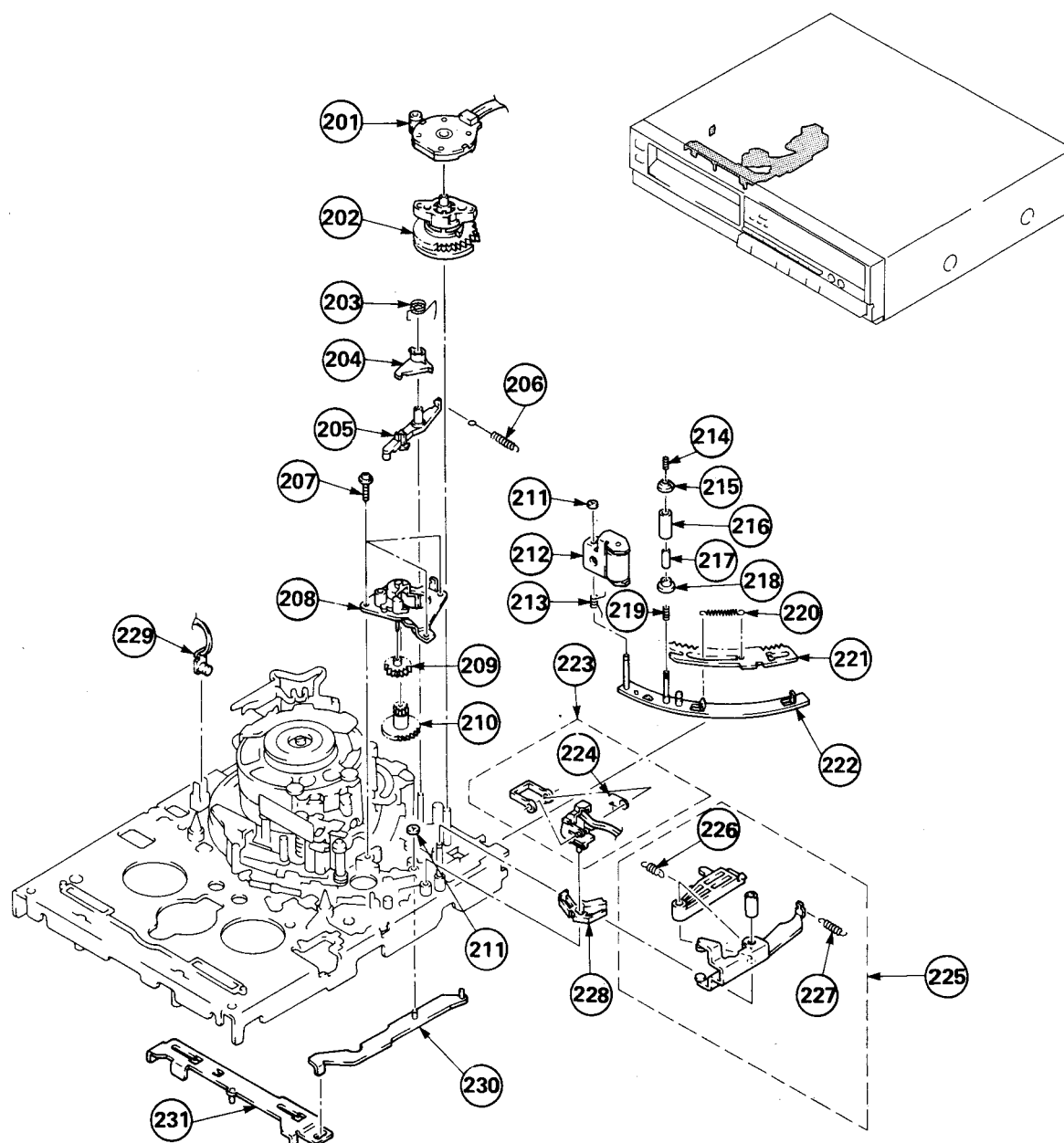
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
101	3-716-098-01	DOOR		112	A-6751-335-A	ARM (RIGHT) BLOCK ASSY, DRIVING	113
102	*A-6751-339-K	LOADING BLOCK ASSY, FRONT	103-121	113	3-716-029-01	SPRING (RIGHT), TORSION	
103	A-6751-334-A	ARM (LEFT) BLOCK ASSY, DRIVING	104	114	3-716-069-01	GEAR, DRIVING	
104	3-716-030-01	SPRING (LEFT), TORSION		115	3-716-082-01	WHEEL, WORM	
105	*3-716-127-01	PLATE, TOP		116	3-716-094-01	COVER, GEAR	
106	3-716-021-01	LOCK, DECK		117	*3-886-569-00	TUBE, RUBBER	
107	3-716-145-01	BRACKET, MOTOR		118	3-716-155-01	SPRING, TENSION	
108	*3-696-389-01	BUSHING, RUBBER		119	*3-716-048-01	SPRING, TENSION	
109	3-716-028-01	GEAR, WORM		120	*3-716-090-01	LEVER (LEFT), CASSETTE PRESS	
110	X-3696-314-1	MOTOR ASSY, L (LOADING MOTOR) (M902)		121	*3-716-084-02	ARM, DOOR SWITCHING	
111	3-716-083-01	LEVER, CASSETTE IN SWITCH					

5-4. CHASSIS ASSEMBLY (1)



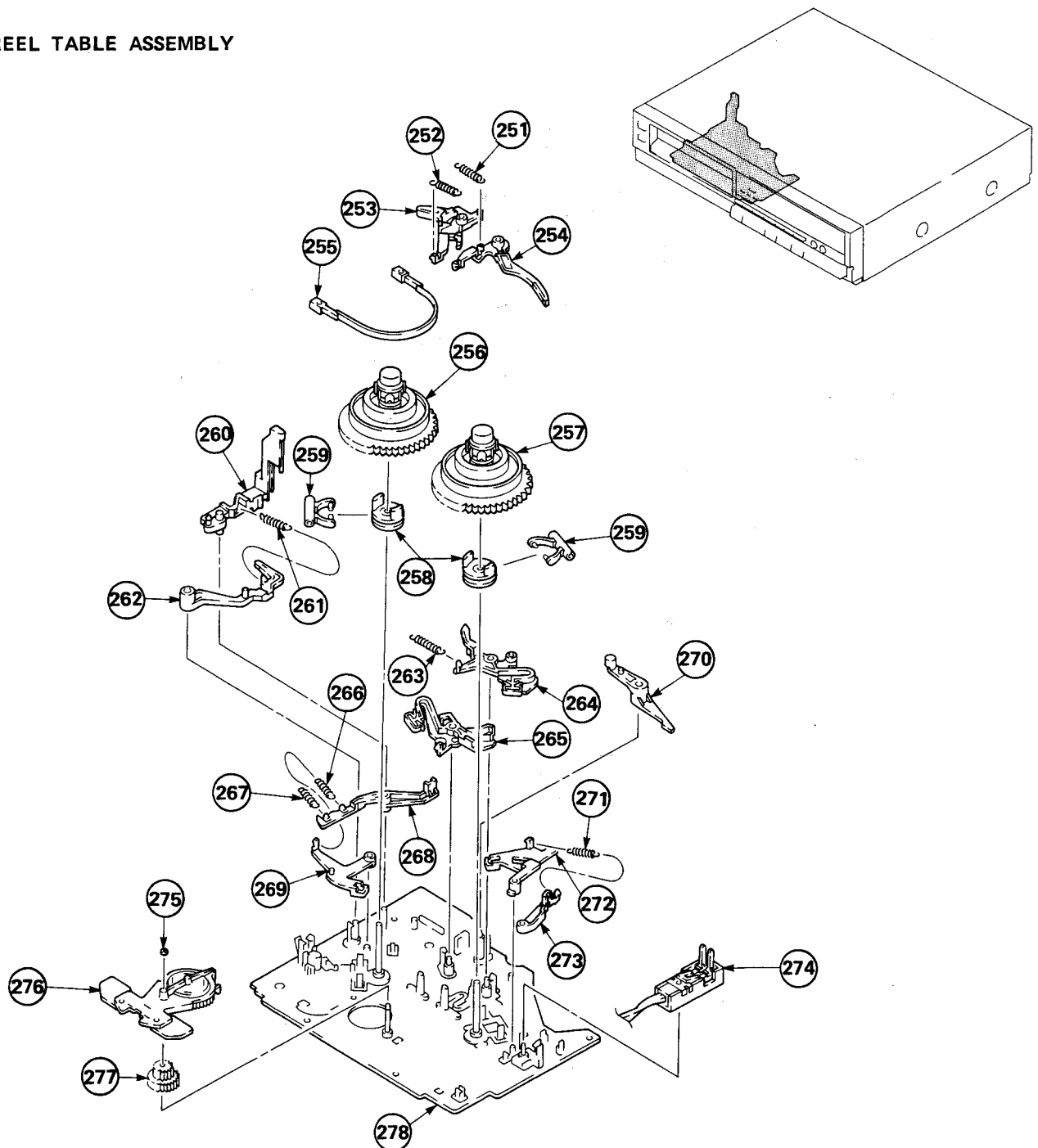
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
151	A-6706-852-A	MOTOR UNIT BLOCK ASSY, L (CAM)	152-158	160	*3-716-058-01	FOOT (RIGHT), MD FITTING	
152	X-3716-020-1	HOLDER ASSY, PLANET GEAR		161	8-835-334-01	MOTOR, DC (BHF-1917B)(CAPSTAN MOTOR)M904	
153	3-716-004-01	GEAR, WORM		162	3-669-465-00	WASHER (1.5), STOPPER	
154	3-696-388-01	RUBBER, JOINT		163	3-716-047-01	GEAR, RELAY	
155	X-3716-012-1	GEAR ASSY, CAM RELAY		164	3-716-017-01	BELT, TIMING	
156	X-3716-018-1	GEAR ASSY, INNER		165	3-716-025-01	HOLDER, BELT	
157	3-696-325-01	GEAR, PLANET		166	X-3716-003-1	ARM ASSY, ADJUSTMENT	
158	X-3716-011-1	GEAR ASSY, DRIVING		167	3-716-031-01	SPRING, TENSION	
				168	3-716-147-01	SCREW (2.6X8), TAPPING	

5-5. CHASSIS ASSEMBLY (2)



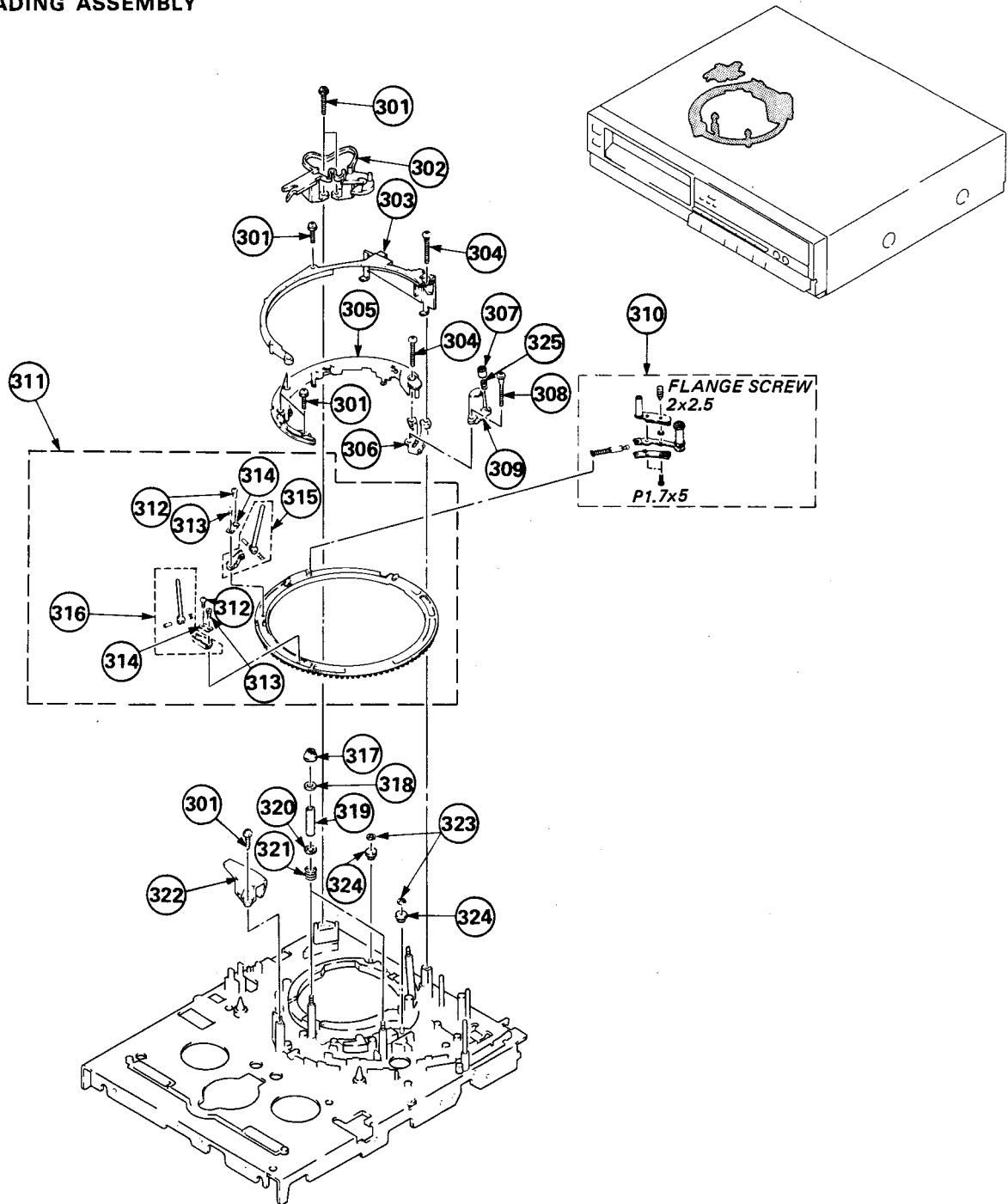
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
201	1-571-024-11	SWITCH, ROTARY (ENCODER SWITCH) (S902)		217	3-672-559-00	SLEEVE, GUIDE	
202	X-3716-015-1	CAM ASSY		218	3-669-432-00	FLANGE (LOWER) (#9), GUIDE	
203	3-696-343-01	SPRING		219	3-693-941-01	SPRING (#9), COMPRESSION	
204	3-696-337-01	INVERTOR, LOCK ARM		220	3-549-014-00	SPRING, TENSION	
205	X-3696-319-1	ARM ASSY, LOCK		221	3-716-096-01	GEAR, T SLIDER	
206	3-716-052-01	SPRING, TENSION		222	X-3716-027-1	SLIDER (Y) ASSY, T	
207	3-716-147-01	SCREW (2.6X8), TAPPING		223	X-3716-014-1	SENSOR ASSY, T (T COIL SENSOR) (L902)	224
208	X-3716-021-1	CHASSIS ASSY, D GEAR		224	3-716-042-01	SPRING	
209	3-716-013-01	GEAR, T		225	X-3716-019-1	ARM ASSY, PINCH PRESS	226, 227
210	A-6750-229-A	GEAR, S		226	3-716-054-01	SPRING, TENSION	
211	3-669-596-00	WASHER (2.3), STOPPER		227	3-716-051-01	SPRING, TENSION	
212	A-6759-344-A	ARM ASSY, PINCH ROLLER		228	3-716-059-01	ARM, T SHUTTER	
213	3-683-441-01	SPRING		229	1-464-781-11	SENSOR, COIL (S COIL SENSOR) (L901)	
214	3-716-163-01	SCREW, FLANGE		230	X-3716-017-1	LEVER ASSY, CAM	
215	3-676-650-00	FLANGE (UPPER) (#9), GUIDE		231	X-3716-013-1	PLATE ASSY, SLIDE	
216	3-676-649-11	ROLLER (#9), GUIDE					

5-6. REEL TABLE ASSEMBLY



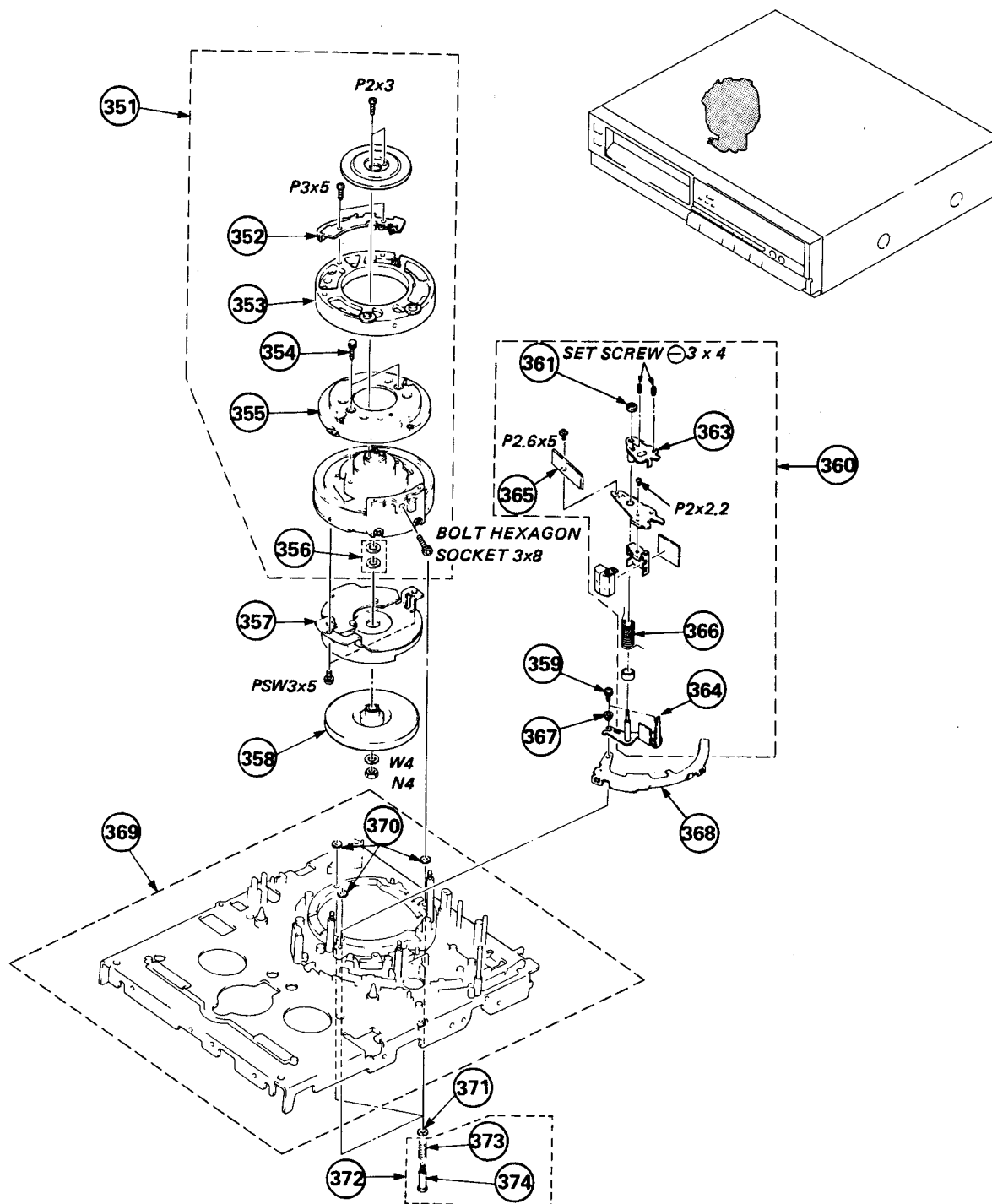
No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
251	3-684-235-01	SPRING, TENSION		265	X-3716-007-1	BRAKE ASSY, S	
252	3-716-032-01	SPRING, TENSION		266	3-691-776-01	SPRING, TENSION	
253	3-716-074-01	ARM, S SOFT BRAKE		267	3-696-394-01	SPRING, TENSION	
254	X-3716-001-1	BRAKE ASSY, T SOFT		268	*3-696-478-01	DETECTOR, S CLUTCH	
255	X-3716-004-1	BAND ASSY, TENSION REGULATOR		269	*3-696-437-01	LEVER, S LIMITER	
256	X-3716-025-1	TABEL ASSY, S REEL		270	X-3716-002-1	SENSOR ASSY, RING	
257	X-3716-026-1	TABEL ASSY, T REEL		271	3-696-398-01	SPRING, TENSION	
258	*3-696-386-01	RING, UD		272	3-716-117-01	LEVER, RD	
259	3-716-019-01	ARM, UD		273	3-716-056-01	ARM, RD	
260	X-3716-005-1	LEVER ASSY, TENSION REGULATOR		274	1-571-023-11	SWITCH, LEAF (2 GANG) (CASSETTE IN/DOWN SWITCH, REC PROOF)S901	
261	*3-716-152-01	SPRING, TENSION		275	3-669-465-00	WASHER (1.5), STOPPER	
262	3-716-072-01	LEVER, FUNCTION		276	A-6759-335-A	ARM BLOCK ASSY, PENDULUM	
263	3-696-395-01	SPRING, TENSION		277	3-716-045-01	GEAR, REEL DRIVING	
264	X-3716-006-1	BRAKE ASSY, T		278	X-3716-028-1	CHASSIS ASSY, SUB	

5-7. S LOADING ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
301	3-716-147-01	SCREW (2.6X8), TAPPING		314	*A-6759-107-C	RETAINER, SPRING, LEAF	
302	3-716-122-01	PLATE, ADJUSTMENT		315	X-3669-430-0	HOLDER BLOCK ASSY, #3 GUIDE	
303	3-716-128-01	GUIDE (2-Y), SHUTTLE		316	X-3669-429-0	HOLDER BLOCK ASSY, #2 GUIDE	
304	3-669-466-21	SCREW (M 2.6)		317	A-6759-246-B	NUT, ADJUSTMENT, GUIDE	
305	3-716-129-01	GUIDE (1-Y), SHUTTLE		318	3-684-135-01	WASHER (UPPER), GUIDE, #7, 8	
306	X-3716-016-1	BASE ASSY, SLANT		319	3-693-830-01	SLEEVE, GUIDE, #7, #8	
307	3-716-038-01	FLANGE, GUIDE, #6		320	3-693-831-01	WASHER, GUIDE	
308	3-669-606-00	SCREW (2.6)		321	3-693-943-01	SPRING (#7, #8), COMPRESSION	
309	8-825-508-61	HEAD, FULL ERASE		322	3-716-033-01	PLATE, GUIDE	
310	A-6750-158-B	SHUTTLE (2) BLOCK ASSY		323	3-669-465-00	WASHER (1.5), STOPPER	
311	X-3716-029-1	RING (B3) ASSY, S	312-316	324	3-669-360-00	ROLLER, RING	
312	3-669-478-00	SCREW (1X3), TAPPING		325	3-716-167-01	SPRING, COMPRESSION	
313	3-672-586-00	SCREW (1.4X3), TAPPING					

5-8. DRUM ASSEMBLY



No.	Part No.	Description	Remark	No.	Part No.	Description	Remark
351	A-6050-492-A	DRUM ASSY (DSH-90A-R)		363	X-3716-008-1	PLATE ASSY, ADJUSTMENT, ACE	
352	A-6760-066-B	SPRING ASSY, TAPE RETAINER	352-356	364	X-3716-009-1	CHASSIS ASSY, ACE	
353	A-6760-138-A	DRUM ASSY, UPPER		365	3-693-895-01	PROTECTOR (S)	
354	3-669-157-00	BOLT (WASHER) (2.6X8)		366	3-716-015-01	SPRING	
355	A-6762-302-A	DISK ASSY (DSR-90-R)		367	3-684-247-01	BUSHING, ACE	
356	X-3669-105-0	SPACER BLOCK ASSY		368	*3-716-073-01	RECLINER, PIN	
357	X-2621-228-1	STATOR ASSY, D		369	*X-3716-031-1	CHASSIS ASSY, MECHANICAL	370
358	X-2621-202-0	ROTOR ASSY, D		370	3-669-646-00	SPACER, DRUM	
359	3-716-146-01	SCREW (2.6X12)		371	3-669-600-11	WASHER, FLAT (3.5)	
360	A-6761-122-A	HEAD BLOCK ASSY, ACE	361-366	372	X-3693-838-1	SCREW ASSY, FITTING	373, 374
361	3-684-246-02	NUT, ADJUSTMENT, HEIGHT, ACE		373	3-429-123-00	SPRING	
				374	3-694-212-01	SCREW, FITTING	

SECTION 6

ELECTRICAL PARTS LIST

NOTE:

The components identified by mark or dotted line with mark are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

- Due to standardization, replacements in the parts list may be different from the parts specified in the diagrams or the components used on the set.
- —XX, —X mean standardized parts, so they may have some difference from the original one.
- **RESISTORS**
All resistors are in ohms
METAL : Metal-film resistor
METAL OXIDE : Metal Oxide-film resistor
F : nonflammable
- Items marked "*" are not stocked since they are seldom required for routine service. Some delay should be anticipated when ordering these items.
- **SEMICONDUCTORS**
In each case, U : μ , for example:
UA... : μ A..., UPA... : μ PA...,
UPB... : μ PB..., UPC... : μ PC...,
UPD... : μ PD...
- **CAPACITORS**
MF : μ F, PF : μ μ F
- **COILS**
MMH : mH, UH : μ H

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
	*A-6711-986-A	VI-50 BOARD, COMPLETE *****		C054	1-161-379-00	CERAMIC 0.01MF 30% 16V	
	*3-710-673-01	SUPPORT, PC BOARD		C056	1-161-379-00	CERAMIC 0.01MF 30% 16V	
	3-723-178-01	COVER, JACK		C057	1-162-205-31	CERAMIC 18PF 5% 50V	
	3-723-180-01	CASE, SHIELD, VI		C058	1-124-446-11	ELECT 47MF 20% 10V	
				C059	1-124-442-91	ELECT 330MF 20% 6.3V	
		CAPACITOR		C060	1-162-202-31	CERAMIC 13PF 5% 50V	
C005	1-164-159-11	CERAMIC 0.1MF 50V		C061	1-162-216-31	CERAMIC 51PF 5% 50V	
C006	1-124-446-11	ELECT 47MF 20% 10V		C062	1-162-216-31	CERAMIC 51PF 5% 50V	
C007	1-123-356-00	ELECT 10MF 20% 16V		C063	1-162-202-31	CERAMIC 13PF 5% 50V	
C008	1-164-159-11	CERAMIC 0.1MF 50V		C067	1-102-820-00	CERAMIC 330PF 5% 50V	
C009	1-124-925-11	ELECT 2.2MF 20% 50V		C068	1-102-824-00	CERAMIC 470PF 5% 50V	
C010	1-124-446-11	ELECT 47MF 20% 10V		C069	1-102-816-19	CERAMIC 120PF 5% 50V	
C011	1-123-356-00	ELECT 10MF 20% 16V		C070	1-164-159-11	CERAMIC 0.1MF 50V	
C012	1-102-973-00	CERAMIC 100PF 5% 50V		C071	1-161-043-00	CERAMIC 0.0022MF 10% 25V	
C013	1-161-379-00	CERAMIC 0.01MF 30% 16V		C072	1-162-201-31	CERAMIC 12PF 5% 50V	
C014	1-162-560-11	CERAMIC 0.047MF 16V		C073	1-102-981-00	CERAMIC 300PF 5% 50V	
C016	1-101-361-00	CERAMIC 150PF 5% 50V		C074	1-123-611-91	ELECT 1MF 20% 50V	
C017	1-161-379-00	CERAMIC 0.01MF 30% 16V		C076	1-162-215-31	CERAMIC 47PF 5% 50V	
C018	1-161-379-00	CERAMIC 0.01MF 30% 16V		C077	1-161-379-00	CERAMIC 0.01MF 30% 16V	
C019	1-162-560-11	CERAMIC 0.047MF 16V		C101	1-124-277-91	ELECT 4.7MF 20% 35V	
C020	1-161-379-00	CERAMIC 0.01MF 30% 16V		C102	1-123-356-00	ELECT 10MF 20% 16V	
C021	1-161-379-00	CERAMIC 0.01MF 30% 16V		C103	1-124-443-00	ELECT 100MF 20% 10V	
C022	1-123-617-91	ELECT 10MF 20% 16V		C104	1-102-936-00	CERAMIC 3PF 0.25PF 50V	
C023	1-161-379-00	CERAMIC 0.01MF 30% 16V		C105	1-101-888-00	CERAMIC 68PF 5% 50V	
C025	1-162-199-31	CERAMIC 10PF 5% 50V		C106	1-162-210-31	CERAMIC 30PF 5% 50V	
C026	1-161-057-00	CERAMIC 0.033MF 10% 25V		C107	1-123-356-00	ELECT 10MF 20% 16V	
C027	1-102-822-00	CERAMIC 390PF 5% 50V		C108	1-162-213-31	CERAMIC 39PF 5% 50V	
C028	1-101-361-00	CERAMIC 150PF 5% 50V		C109	1-123-369-00	ELECT 4.7MF 20% 25V	
C029	1-162-851-11	CERAMIC 0.1MF 16V		C110	1-161-379-00	CERAMIC 0.01MF 30% 16V	
C030	1-162-200-31	CERAMIC 11PF 5% 50V		C111	1-164-159-11	CERAMIC 0.1MF 50V	
C031	1-162-560-11	CERAMIC 0.047MF 16V		C112	1-124-446-11	ELECT 47MF 20% 10V	
C032	1-124-446-11	ELECT 47MF 20% 10V		C113	1-124-446-11	ELECT 47MF 20% 10V	
C033	1-130-491-00	MYLAR 0.047MF 5% 50V		C114	1-161-039-00	CERAMIC 0.001MF 10% 25V	
C034	1-161-043-00	CERAMIC 0.0022MF 10% 25V		C116	1-161-379-00	CERAMIC 0.01MF 30% 16V	
C035	1-130-471-00	MYLAR 0.001MF 5% 50V		C117	1-123-622-91	ELECT 22MF 20% 16V	
C036	1-123-356-00	ELECT 10MF 20% 16V		C118	1-123-622-91	ELECT 22MF 20% 16V	
C037	1-102-977-00	CERAMIC 200PF 5% 50V		C119	1-161-379-00	CERAMIC 0.01MF 30% 16V	
C038	1-102-973-00	CERAMIC 100PF 5% 50V		C120	1-102-980-00	CERAMIC 270PF 5% 50V	
C039	1-161-379-00	CERAMIC 0.01MF 30% 16V		C121	1-124-446-11	ELECT 47MF 20% 10V	
C040	1-161-379-00	CERAMIC 0.01MF 30% 16V		C122	1-123-356-00	ELECT 10MF 20% 16V	
C041	1-124-446-11	ELECT 47MF 20% 10V		C123	1-124-925-11	ELECT 2.2MF 20% 50V	
C042	1-161-379-00	CERAMIC 0.01MF 30% 16V		C124	1-162-200-31	CERAMIC 11PF 5% 50V	
C043	1-161-379-00	CERAMIC 0.01MF 30% 16V		C125	1-162-200-31	CERAMIC 11PF 5% 50V	
C045	1-162-209-31	CERAMIC 27PF 5% 50V		C126	1-162-851-11	CERAMIC 0.1MF 16V	
C046	1-124-446-11	ELECT 47MF 20% 10V		C127	1-162-199-31	CERAMIC 10PF 5% 50V	
C047	1-124-446-11	ELECT 47MF 20% 10V		C128	1-124-446-11	ELECT 47MF 20% 10V	
C048	1-124-446-11	ELECT 47MF 20% 10V		C129	1-124-446-11	ELECT 47MF 20% 10V	
C049	1-124-446-11	ELECT 47MF 20% 10V		C135	1-124-446-11	ELECT 47MF 20% 10V	
C050	1-123-356-00	ELECT 10MF 20% 16V		C136	1-102-822-00	CERAMIC 390PF 5% 50V	
C052	1-124-446-11	ELECT 47MF 20% 10V		C137	1-102-824-00	CERAMIC 470PF 5% 50V	
C053	1-124-446-11	ELECT 47MF 20% 10V		C151	1-162-205-31	CERAMIC 18PF 5% 50V	
				C152	1-161-379-00	CERAMIC 0.01MF 30% 16V	
				C153	1-161-379-00	CERAMIC 0.01MF 30% 16V	

Ref.No	Part No.	Description			Remark	Ref.No	Part No.	Description			Remark
C176	1-161-379-00	CERAMIC	0.01MF	30%	16V	C240	1-162-560-11	CERAMIC	0.047MF		16V
C177	1-161-379-00	CERAMIC	0.01MF	30%	16V	C241	1-124-499-11	ELECT	1MF	20%	50V
C178	1-161-379-00	CERAMIC	0.01MF	30%	16V	C250	1-161-379-00	CERAMIC	0.01MF	30%	16V
C179	1-162-560-11	CERAMIC	0.047MF		16V	C251	1-161-379-00	CERAMIC	0.01MF	30%	16V
C180	1-123-622-91	ELECT	22MF	20%	16V	C252	1-161-051-00	CERAMIC	0.01MF	10%	25V
C181	1-162-560-11	CERAMIC	0.047MF		16V	C253	1-130-472-00	MYLAR	0.0012MF	5%	50V
C182	1-124-446-11	ELECT	47MF	20%	10V	C254	1-123-382-00	ELECT	3.3MF	20%	50V
C183	1-162-560-11	CERAMIC	0.047MF		16V	C255	1-130-471-00	MYLAR	0.001MF	5%	50V
C184	1-161-379-00	CERAMIC	0.01MF	30%	16V	C256	1-161-045-00	CERAMIC	0.0033MF	10%	25V
C185	1-162-851-11	CERAMIC	0.1MF		16V	C257	1-123-356-00	ELECT	10MF	20%	16V
C186	1-102-963-00	CERAMIC	33PF	5%	50V	C258	1-101-059-00	CERAMIC	510PF	5%	50V
C187	1-102-971-00	CERAMIC	82PF	5%	50V	C259	1-162-216-31	CERAMIC	51PF	5%	50V
C188	1-161-046-00	CERAMIC	0.0039MF	10%	25V	C260	1-161-379-00	CERAMIC	0.01MF	30%	16V
C189	1-102-963-00	CERAMIC	33PF	5%	50V	C261	1-164-159-11	CERAMIC	0.1MF		50V
C190	1-102-963-00	CERAMIC	33PF	5%	50V	C262	1-161-379-00	CERAMIC	0.01MF	30%	16V
C191	1-161-379-00	CERAMIC	0.01MF	30%	16V	C263	1-101-361-00	CERAMIC	150PF	5%	50V
C192	1-162-209-31	CERAMIC	27PF	5%	50V	C264	1-161-379-00	CERAMIC	0.01MF	30%	16V
C193	1-102-973-00	CERAMIC	100PF	5%	50V	C265	1-102-816-00	CERAMIC	120PF	5%	50V
C194	1-102-973-00	CERAMIC	100PF	5%	50V	C266	1-162-216-31	CERAMIC	51PF	5%	50V
C200	1-161-379-00	CERAMIC	0.01MF	30%	16V	C277	1-161-379-00	CERAMIC	0.01MF	30%	16V
C201	1-102-977-00	CERAMIC	200PF	5%	50V	C278	1-162-294-31	CERAMIC	0.001MF	10%	50V
C202	1-161-051-00	CERAMIC	0.01MF	10%	25V	C279	1-161-379-00	CERAMIC	0.01MF	30%	16V
C203	1-102-963-00	CERAMIC	33PF	5%	50V	C316	1-102-961-00	CERAMIC	27PF	5%	50V
C204	1-123-330-00	ELECT	22MF	20%	16V	C401	1-162-560-11	CERAMIC	0.047MF		16V
C205	1-123-330-00	ELECT	22MF	20%	16V	C402	1-124-446-11	ELECT	47MF	20%	10V
C206	1-161-379-00	CERAMIC	0.01MF	30%	16V	C403	1-102-971-00	CERAMIC	82PF	5%	50V
C207	1-124-499-11	ELECT	1MF	20%	50V	C405	1-124-499-11	ELECT	1MF	20%	50V
C208	1-161-024-00	CERAMIC	0.082MF	10%	25V	C406	1-102-971-00	CERAMIC	82PF	5%	50V
C209	1-101-888-00	CERAMIC	68PF	5%	50V	C407	1-161-055-00	CERAMIC	0.022MF	10%	25V
C210	1-102-959-00	CERAMIC	22PF	5%	50V	C408	1-162-215-31	CERAMIC	47PF	5%	50V
C211	1-101-886-00	CERAMIC	62PF	5%	50V	C409	1-124-499-11	ELECT	1MF	20%	50V
C212	1-102-816-00	CERAMIC	120PF	5%	50V	C410	1-161-379-00	CERAMIC	0.01MF	30%	16V
C213	1-161-379-00	CERAMIC	0.01MF	30%	16V	C411	1-162-851-11	CERAMIC	0.1MF		16V
C214	1-161-379-00	CERAMIC	0.01MF	30%	16V	C412	1-124-442-91	ELECT	330MF	20%	6.3V
C215	1-161-379-00	CERAMIC	0.01MF	30%	16V	C501	1-124-499-11	ELECT	1MF	20%	50V
C216	1-102-973-00	CERAMIC	100PF	5%	50V	C502	1-123-356-00	ELECT	10MF	20%	16V
C217	1-130-471-00	MYLAR	0.001MF	5%	50V	C503	1-123-356-00	ELECT	10MF	20%	16V
C218	1-130-047-00	FILM	180PF	5%	50V	C504	1-102-971-00	CERAMIC	82PF	5%	50V
C219	1-123-382-00	ELECT	3.3MF	20%	50V	C505	1-102-971-00	CERAMIC	82PF	5%	50V
C220	1-124-499-11	ELECT	1MF	20%	50V	C506	1-123-356-00	ELECT	10MF	20%	16V
C221	1-161-021-11	CERAMIC	0.047MF	10%	25V	C507	1-161-379-00	CERAMIC	0.01MF	30%	16V
C222	1-102-963-00	CERAMIC	33PF	5%	50V	C508	1-161-379-00	CERAMIC	0.01MF	30%	16V
C223	1-102-971-00	CERAMIC	82PF	5%	50V	C509	1-161-055-00	CERAMIC	0.022MF	10%	25V
C230	1-130-487-00	MYLAR	0.022MF	5%	50V	C510	1-123-330-00	ELECT	22MF	20%	16V
C231	1-102-965-00	CERAMIC	39PF	5%	50V	C511	1-161-379-00	CERAMIC	0.01MF	30%	16V
C232	1-102-936-00	CERAMIC	3PF	0.25PF	50V	C512	1-162-294-31	CERAMIC	0.001MF	10%	50V
C233	1-161-379-00	CERAMIC	0.01MF	30%	16V	C513	1-161-021-11	CERAMIC	0.047MF	10%	25V
C234	1-102-820-00	CERAMIC	330PF	5%	50V	C514	1-162-209-31	CERAMIC	27PF	5%	50V
C235	1-124-446-11	ELECT	47MF	20%	10V	C515	1-162-294-31	CERAMIC	0.001MF	10%	50V
C236	1-124-499-11	ELECT	1MF	20%	50V	C516	1-161-021-11	CERAMIC	0.047MF	10%	25V
C237	1-161-051-00	CERAMIC	0.01MF	10%	25V	C517	1-162-209-31	CERAMIC	27PF	5%	50V
C238	1-161-379-00	CERAMIC	0.01MF	30%	16V	C518	1-124-446-11	ELECT	47MF	20%	10V
C239	1-123-369-00	ELECT	4.7MF	20%	25V						

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C519	1-123-356-00	ELECT	10MF 20%	16V	D022	8-719-911-19	DIODE 1SS119
C520	1-162-851-11	CERAMIC	0.1MF	16V	D023	8-719-911-19	DIODE 1SS119
C522	1-123-330-00	ELECT	22MF 20%	16V	D024	8-719-911-19	DIODE 1SS119
C523	1-162-560-11	CERAMIC	0.047MF	16V	D025	8-719-911-19	DIODE 1SS119
C524	1-124-446-11	ELECT	47MF 20%	10V	D027	8-719-911-19	DIODE 1SS119
C525	1-102-978-00	CERAMIC	220PF 5%	50V	D028	8-719-911-19	DIODE 1SS119
C526	1-102-973-00	CERAMIC	100PF 5%	50V	D029	8-719-911-19	DIODE 1SS119
C527	1-164-159-11	CERAMIC	0.1MF	50V	D030	8-719-911-19	DIODE 1SS119
C528	1-102-971-00	CERAMIC	82PF 5%	50V	D031	8-719-911-19	DIODE 1SS119
C529	1-124-471-00	ELECT	1000MF 20%	6.3V	D401	8-719-000-12	DIODE MC931
C530	1-124-443-00	ELECT	100MF 20%	6.3V	D402	8-719-911-19	DIODE 1SS119
C531	1-123-356-00	ELECT	10MF 20%	16V	D403	8-719-000-12	DIODE MC931
C532	1-161-379-00	CERAMIC	0.01MF 30%	16V	D404	8-719-911-19	DIODE 1SS119
C533	1-162-560-11	CERAMIC	0.047MF	16V	D405	8-719-911-19	DIODE 1SS119
C534	1-161-379-00	CERAMIC	0.01MF 30%	16V	D406	8-719-911-19	DIODE 1SS119
C537	1-102-973-00	CERAMIC	100PF 5%	50V	D407	8-719-911-19	DIODE 1SS119
C539	1-102-958-00	CERAMIC	20PF 5%	50V	D503	8-719-911-19	DIODE 1SS119
C540	1-162-205-31	CERAMIC	18PF 5%	50V	D504	8-719-911-19	DIODE 1SS119
C543	1-124-446-11	ELECT	47MF 20%	10V	D505	8-719-911-19	DIODE 1SS119
C544	1-162-294-31	CERAMIC	0.001MF 10%	50V	D506	8-719-911-19	DIODE 1SS119
C545	1-162-294-31	CERAMIC	0.001MF 10%	50V	D507	8-719-911-19	DIODE 1SS119
<u>FILTER</u>				D509	8-719-911-19	DIODE 1SS119	
CF201	1-231-302-00	CERAMIC FILTER (4.27MHZ)		D510	8-719-911-19	DIODE 1SS119	
CF202	1-527-875-00	FILTER, CERAMIC (5.12MHz)		D513	8-719-911-19	DIODE 1SS119	
<u>CONNECTOR</u>				D514	8-719-911-19	DIODE 1SS119	
CN001	*1-563-604-11	CONNECTOR, FLEXIBLE 27P		<u>DELAY LINE</u>			
CN002	*1-560-891-00	PIN, CONNECTOR 3P		DL001	1-415-440-11	DELAY LINE, LC (444NS)	
CN003	*1-564-009-00	PIN, CONNECTOR 10P		DL002	1-415-352-11	DELAY LINE, 1H	
CN004	*1-560-894-00	PIN, CONNECTOR 6P		DL006	1-415-556-11	DELAY LINE, 1H (ULTRASONIC)	
<u>JACK</u>				<u>FILTER</u>			
CNJ001	1-563-556-11	JACK, PIN (WITH SW) 2P (LINE IN VIDEO/AUDIO)		FL001	1-235-558-11	FILTER, LOW PASS	
CNJ002	1-507-500-71	JACK, PIN 2P (LINE OUT VIDEO/AUDIO)		FL002	1-236-044-11	LPF (Y)	
<u>DIODE</u>				FL501	1-421-927-21	FILTER, NOISE	
D001	8-719-911-11	DIODE 1SS119		FL502	1-421-927-21	FILTER, NOISE	
D002	8-719-911-11	DIODE 1SS119		<u>IC</u>			
D003	8-719-911-11	DIODE 1SS119		IC001	8-759-101-62	IC CX20043	
D005	8-719-911-11	DIODE 1SS119		IC002	8-758-662-00	IC CX-866B	
D006	8-719-911-11	DIODE 1SS119		IC003	8-759-200-60	IC TA7060AP	
D007	8-719-911-11	DIODE 1SS119		IC004	8-759-203-XX	IC CX10021B-NP	
D008	8-719-911-11	DIODE 1SS119		IC007	8-759-202-47	IC CX10023	
D009	8-719-911-11	DIODE 1SS119		IC009	8-759-909-20	IC BA634	
D015	8-719-911-11	DIODE 1SS119		IC401	1-808-004-11	HYBRID BLOCK BS6326A	
D016	8-719-911-11	DIODE 1SS119		IC402	1-807-801-21	HYBRID BLOCK BS6300	
D017	8-719-101-64	DIODE RD6.8E-L2		IC403	8-759-240-53	IC TC4053BP	
D018	8-719-911-19	DIODE 1SS119		IC501	8-759-800-81	IC LA7016	
D019	8-719-911-19	DIODE 1SS119		IC502	8-752-328-76	IC CXL1008P-1	
D020	8-719-911-19	DIODE 1SS119		<u>COIL</u>			
D021	8-719-911-19	DIODE 1SS119		L001	1-408-427-00	INDUCTOR	330UH
				L002	1-410-521-11	INDUCTOR	100UH

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
L003	1-408-427-00	INDUCTOR 330UH		Q016	8-729-904-37	TRANSISTOR DTC114YS-TP	
L004	1-410-522-11	INDUCTOR 120UH		Q017	8-729-900-61	TRANSISTOR DTA114ES	
L005	1-410-519-11	INDUCTOR 68UH		Q018	8-729-117-54	TRANSISTOR 2SA1175-F	
L006	1-410-517-11	INDUCTOR 47UH		Q019	8-729-900-61	TRANSISTOR DTA114ES	
L007	1-410-522-11	INDUCTOR 120UH		Q020	8-729-117-54	TRANSISTOR 2SA1175-F	
L008	1-410-335-11	INDUCTOR 150UH		Q021	8-729-178-54	TRANSISTOR 2SC2785-F	
L009	1-410-522-11	INDUCTOR 120UH		Q022	8-729-178-54	TRANSISTOR 2SC2785-F	
L012	1-410-509-11	INDUCTOR 10UH		Q023	8-729-902-80	TRANSISTOR DTA123YS	
L013	1-410-522-11	INDUCTOR 120UH		Q024	8-729-904-37	TRANSISTOR DTC114YS-TP	
L014	1-410-517-11	INDUCTOR 47UH		Q025	8-729-117-54	TRANSISTOR 2SA1175-F	
L016	1-410-517-21	INDUCTOR 47UH		Q026	8-729-178-54	TRANSISTOR 2SC2785-F	
L020	1-408-397-00	INDUCTOR 1UH		Q027	8-729-178-54	TRANSISTOR 2SC2785-F	
L021	1-408-397-00	INDUCTOR 1UH		Q029	8-729-178-54	TRANSISTOR 2SC2785-F	
L023	1-410-525-11	INDUCTOR 220UH		Q030	8-729-178-54	TRANSISTOR 2SC2785-F	
L024	1-408-428-00	INDUCTOR 390UH		Q031	8-729-900-36	TRANSISTOR DTC124ES	
L025	1-410-525-11	INDUCTOR 220UH		Q032	8-729-178-54	TRANSISTOR 2SC2785-F	
L026	1-410-520-11	INDUCTOR 82UH		Q033	8-729-178-54	TRANSISTOR 2SC2785-F	
L029	1-408-428-00	INDUCTOR 390UH		Q034	8-729-178-54	TRANSISTOR 2SC2785-F	
L030	1-410-524-41	INDUCTOR 180UH		Q035	8-729-178-54	TRANSISTOR 2SC2785-F	
L031	1-407-495-00	INDUCTOR 1.8MMH		Q037	8-729-178-54	TRANSISTOR 2SC2785-F	
L032	1-408-429-00	INDUCTOR 470UH		Q038	8-729-904-37	TRANSISTOR DTC114YS-TP	
L033	1-410-515-11	INDUCTOR 33UH		Q039	8-729-178-54	TRANSISTOR 2SC2785-F	
L034	1-408-947-00	INDUCTOR 2.2MMH		Q040	8-729-904-37	TRANSISTOR DTC114YS-TP	
L035	1-407-499-00	INDUCTOR 3.9MMH		Q041	8-729-904-37	TRANSISTOR DTC114YS-TP	
L036	1-408-602-21	INDUCTOR 8.2UH		Q042	8-729-902-80	TRANSISTOR DTA123YS	
L037	1-408-600-21	INDUCTOR 5.6UH		Q044	8-729-117-54	TRANSISTOR 2SA1175-F	
L038	1-410-509-11	INDUCTOR 10UH		Q045	8-729-178-54	TRANSISTOR 2SC2785-F	
L402	1-410-519-11	INDUCTOR 68UH		Q046	8-729-178-54	TRANSISTOR 2SC2785-F	
L501	1-410-509-11	INDUCTOR 10UH		Q047	8-729-178-54	TRANSISTOR 2SC2785-F	
L502	1-410-521-11	INDUCTOR 100UH		Q048	8-729-178-54	TRANSISTOR 2SC2785-F	
L503	1-410-516-11	INDUCTOR 39UH		Q049	8-729-178-54	TRANSISTOR 2SC2785-F	
L505	1-410-514-11	INDUCTOR 27UH		Q050	8-729-178-54	TRANSISTOR 2SC2785-F	
L506	1-410-514-11	INDUCTOR 27UH		Q051	8-729-900-89	TRANSISTOR DTC144ES	
<u>TRANSISTOR</u>				Q052	8-729-801-93	TRANSISTOR 2SD1387	
Q001	8-729-178-54	TRANSISTOR 2SC2785-F		Q053	8-729-178-54	TRANSISTOR 2SC2785-F	
Q002	8-729-900-63	TRANSISTOR DTA124ES		Q054	8-729-900-36	TRANSISTOR DTC124ES	
Q003	8-729-178-54	TRANSISTOR 2SC2785-F		Q055	8-729-178-54	TRANSISTOR 2SC2785-F	
Q004	8-729-178-54	TRANSISTOR 2SC2785-F		Q056	8-729-178-54	TRANSISTOR 2SC2785-F	
Q005	8-729-117-54	TRANSISTOR 2SA1175-F		Q057	8-729-117-54	TRANSISTOR 2SA1175-F	
Q006	8-729-904-37	TRANSISTOR DTC114YS-TP		Q058	8-729-178-54	TRANSISTOR 2SC2785	
Q007	8-729-902-80	TRANSISTOR DTA123YS		Q059	8-729-900-89	TRANSISTOR DTC144ES	
Q008	8-729-904-37	TRANSISTOR DTC114YS-TP		Q060	8-729-900-89	TRANSISTOR DTC144ES	
Q009	8-729-178-54	TRANSISTOR 2SC2785-F		Q061	8-729-900-36	TRANSISTOR DTC124ES	
Q010	8-729-178-54	TRANSISTOR 2SC2785-F		Q062	8-729-117-54	TRANSISTOR 2SA1175-F	
Q011	8-729-178-54	TRANSISTOR 2SC2785-F		Q063	8-729-900-36	TRANSISTOR DTC124ES	
Q012	8-729-178-54	TRANSISTOR 2SC2785-F		Q064	8-729-117-54	TRANSISTOR 2SA1175-F	
Q014	8-729-904-37	TRANSISTOR DTC114YS-TP		Q065	8-729-178-54	TRANSISTOR 2SC2785-F	
Q015	8-729-902-80	TRANSISTOR DTA123YS		Q066	8-729-900-89	TRANSISTOR DTC144ES	
				Q067	8-729-178-54	TRANSISTOR 2SC2785-F	
				Q068	8-729-900-89	TRANSISTOR DTC144ES	
				Q069	8-729-178-54	TRANSISTOR 2SC2785	
				Q070	8-729-900-89	TRANSISTOR DTC144ES	
				Q071	8-729-900-89	TRANSISTOR DTC144ES	

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
Q072	8-729-178-54	TRANSISTOR 2SC2785-F		R024	1-249-441-11	CARBON 100K 5%	1/4W
Q073	8-729-904-37	TRANSISTOR DTC114YS-TP		R025	1-249-427-11	CARBON 6.8K 5%	1/4W
Q087	8-729-900-63	TRANSISTOR DTA124ES		R026	1-249-415-11	CARBON 680 5%	1/4W
Q088	8-729-904-37	TRANSISTOR DTC114YS-TP		R027	1-249-425-11	CARBON 4.7K 5%	1/4W
Q401	8-729-900-63	TRANSISTOR DTA124ES		R028	1-249-433-11	CARBON 22K 5%	1/4W
Q402	8-729-178-54	TRANSISTOR 2SC2785-F		R029	1-249-430-11	CARBON 12K 5%	1/4W
Q403	8-729-900-61	TRANSISTOR DTA114ES		R030	1-247-903-00	CARBON 1M 5%	1/4W
Q404	8-729-178-54	TRANSISTOR 2SC2785-F		R031	1-249-430-11	CARBON 12K 5%	1/4W
Q405	8-729-900-89	TRANSISTOR DTC144ES		R032	1-247-895-00	CARBON 470K 5%	1/4W
Q406	8-729-178-54	TRANSISTOR 2SC2785-F		R033	1-249-432-11	CARBON 18K 5%	1/4W
Q501	8-729-117-54	TRANSISTOR 2SA1175-F		R034	1-249-421-11	CARBON 2.2K 5%	1/4W
Q502	8-729-178-54	TRANSISTOR 2SC2785-F		R035	1-249-417-11	CARBON 1K 5%	1/4W
Q503	8-729-178-54	TRANSISTOR 2SC2785-F		R036	1-249-421-11	CARBON 2.2K 5%	1/4W
Q504	8-729-178-54	TRANSISTOR 2SC2785-F		R037	1-249-405-11	CARBON 100 5%	1/4W
Q505	8-729-117-54	TRANSISTOR 2SA1175-F		R038	1-249-417-11	CARBON 1K 5%	1/4W
Q506	8-729-178-54	TRANSISTOR 2SC2785-F		R039	1-249-417-11	CARBON 1K 5%	1/4W
Q508	8-729-178-54	TRANSISTOR 2SC2785-F		R040	1-249-423-11	CARBON 3.3K 5%	1/4W
Q509	8-729-266-93	TRANSISTOR 2SC2669		R041	1-249-432-11	CARBON 18K 5%	1/4W
Q510	8-729-117-54	TRANSISTOR 2SA1175-F		R042	1-249-431-11	CARBON 15K 5%	1/4W
Q511	8-729-178-54	TRANSISTOR 2SC2785-F		R043	1-249-421-11	CARBON 2.2K 5%	1/4W
Q512	8-729-117-54	TRANSISTOR 2SA1175-F		R044	1-249-405-11	CARBON 100 5%	1/4W
Q513	8-729-178-54	TRANSISTOR 2SC2785-F		R045	1-249-433-11	CARBON 22K 5%	1/4W
Q514	8-729-900-36	TRANSISTOR DTC124ES		R046	1-249-429-11	CARBON 10K 5%	1/4W
Q515	8-729-900-36	TRANSISTOR DTC124ES		R047	1-249-417-11	CARBON 1K 5%	1/4W
Q516	8-729-900-89	TRANSISTOR DTC144ES		R048	1-249-421-11	CARBON 2.2K 5%	1/4W
Q517	8-729-900-89	TRANSISTOR DTC144ES		R049	1-249-412-11	CARBON 390 5%	1/4W
Q519	8-729-178-54	TRANSISTOR 2SC2785-F		R051	1-249-417-11	CARBON 1K 5%	1/4W
Q520	8-729-904-37	TRANSISTOR DTC114YS-TP		R053	1-249-440-11	CARBON 82K 5%	1/4W
Q521	8-729-117-54	TRANSISTOR 2SA1175-F		R058	1-249-432-11	CARBON 18K 5%	1/4W
Q522	8-729-117-54	TRANSISTOR 2SA1175-F		R059	1-247-804-11	CARBON 75 5%	1/4W
RESISTOR				R060	1-249-408-11	CARBON 180 5%	1/4W
R003	1-247-899-11	CARBON 680K 5%	1/4W	R061	1-249-421-11	CARBON 2.2K 5%	1/4W
R004	1-249-421-11	CARBON 2.2K 5%	1/4W	R063	1-249-427-11	CARBON 6.8K 5%	1/4W
R005	1-249-423-11	CARBON 3.3K 5%	1/4W	R064	1-249-416-11	CARBON 820 5%	1/4W
R006	1-249-426-11	CARBON 5.6K 5%	1/4W	R065	1-247-832-81	CARBON 1.1K 5%	1/4W
R007	1-249-429-11	CARBON 10K 5%	1/4W	R067	1-247-832-11	CARBON 1.1K 5%	1/4W
R008	1-249-440-11	CARBON 82K 5%	1/4W	R068	1-249-417-11	CARBON 1K 5%	1/4W
R009	1-247-883-00	CARBON 150K 5%	1/4W	R069	1-249-426-11	CARBON 5.6K 5%	1/4W
R010	1-249-421-11	CARBON 2.2K 5%	1/4W	R070	1-249-420-11	CARBON 1.8K 5%	1/4W
R011	1-249-419-11	CARBON 1.5K 5%	1/4W	R071	1-249-420-11	CARBON 1.8K 5%	1/4W
R012	1-249-429-11	CARBON 10K 5%	1/4W	R072	1-249-426-11	CARBON 5.6K 5%	1/4W
R013	1-249-413-11	CARBON 470 5%	1/4W	R073	1-249-421-11	CARBON 2.2K 5%	1/4W
R014	1-249-421-11	CARBON 2.2K 5%	1/4W	R074	1-249-421-11	CARBON 2.2K 5%	1/4W
R015	1-249-413-11	CARBON 470 5%	1/4W	R075	1-249-421-11	CARBON 2.2K 5%	1/4W
R016	1-249-417-11	CARBON 1K 5%	1/4W	R077	1-249-412-11	CARBON 390 5%	1/4W
R017	1-249-412-11	CARBON 390 5%	1/4W	R078	1-249-433-11	CARBON 22K 5%	1/4W
R018	1-247-883-00	CARBON 150K 5%	1/4W	R079	1-249-417-11	CARBON 1K 5%	1/4W
R019	1-249-435-11	CARBON 33K 5%	1/4W	R080	1-249-424-11	CARBON 3.9K 5%	1/4W
R020	1-249-405-11	CARBON 100 5%	1/4W	R081	1-249-428-11	CARBON 8.2K 5%	1/4W
R021	1-249-427-11	CARBON 6.8K 5%	1/4W	R082	1-249-415-11	CARBON 680 5%	1/4W
R022	1-249-425-11	CARBON 4.7K 5%	1/4W	R083	1-249-420-11	CARBON 1.8K 5%	1/4W
R023	1-249-425-11	CARBON 4.7K 5%	1/4W	R144	1-247-832-11	CARBON 1.1K 5%	1/4W
				R145	1-249-419-11	CARBON 1.5K 5%	1/4W

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R146	1-249-419-11	CARBON	1.5K 5% 1/4W	R220	1-249-417-11	CARBON	1K 5% 1/4W
R147	1-249-431-11	CARBON	15K 5% 1/4W	R221	1-249-425-11	CARBON	4.7K 5% 1/4W
R148	1-249-428-11	CARBON	8.2K 5% 1/4W	R222	1-249-409-11	CARBON	220 5% 1/4W
R149	1-249-421-11	CARBON	2.2K 5% 1/4W	R223	1-249-429-11	CARBON	10K 5% 1/4W
R150	1-249-425-11	CARBON	4.7K 5% 1/4W	R224	1-249-429-11	CARBON	10K 5% 1/4W
R151	1-249-417-11	CARBON	1K 5% 1/4W	R225	1-249-430-11	CARBON	12K 5% 1/4W
R152	1-249-434-11	CARBON	27K 5% 1/4W	R227	1-249-414-11	CARBON	560 5% 1/4W
R153	1-249-431-11	CARBON	15K 5% 1/4W	R228	1-249-411-11	CARBON	330 5% 1/4W
R154	1-249-417-11	CARBON	1K 5% 1/4W	R229	1-249-426-11	CARBON	5.6K 5% 1/4W
R155	1-249-415-11	CARBON	680 5% 1/4W	R230	1-249-421-11	CARBON	2.2K 5% 1/4W
R156	1-249-413-11	CARBON	470 5% 1/4W	R231	1-249-425-11	CARBON	4.7K 5% 1/4W
R157	1-249-417-11	CARBON	1K 5% 1/4W	R232	1-249-407-11	CARBON	150 5% 1/4W
R158	1-247-832-11	CARBON	1.1K 5% 1/4W	R233	1-249-429-11	CARBON	10K 5% 1/4W
R159	1-247-832-11	CARBON	1.1K 5% 1/4W	R237	1-249-431-11	CARBON	15K 5% 1/4W
R160	1-249-417-11	CARBON	1K 5% 1/4W	R238	1-249-429-11	CARBON	10K 5% 1/4W
R161	1-247-846-11	CARBON	4.3K 5% 1/4W	R250	1-249-422-11	CARBON	2.7K 5% 1/4W
R162	1-249-417-11	CARBON	1K 5% 1/4W	R251	1-249-429-11	CARBON	10K 5% 1/4W
R163	1-249-429-11	CARBON	10K 5% 1/4W	R252	1-249-439-11	CARBON	68K 5% 1/4W
R166	1-247-810-11	CARBON	130 5% 1/4W	R253	1-249-421-11	CARBON	2.2K 5% 1/4W
R167	1-247-810-11	CARBON	130 5% 1/4W	R254	△ 1-212-849-51	FUSIBLE	4.7 5% 1/4W F
R168	1-249-435-11	CARBON	33K 5% 1/4W	R255	1-249-413-11	CARBON	470 5% 1/4W
R169	1-249-437-11	CARBON	47K 5% 1/4W	R256	1-249-422-11	CARBON	2.7K 5% 1/4W
R170	1-249-425-11	CARBON	4.7K 5% 1/4W	R257	1-249-418-11	CARBON	1.2K 5% 1/4W
R171	1-247-812-11	CARBON	160 5% 1/4W	R258	1-249-439-11	CARBON	68K 5% 1/4W
R172	1-249-425-11	CARBON	4.7K 5% 1/4W	R259	1-249-437-11	CARBON	47K 5% 1/4W
R173	1-247-828-11	CARBON	750 5% 1/4W	R260	1-249-421-11	CARBON	2.2K 5% 1/4W
R174	1-249-412-11	CARBON	390 5% 1/4W	R261	1-249-419-11	CARBON	1.5K 5% 1/4W
R175	1-249-415-11	CARBON	680 5% 1/4W	R262	1-249-419-11	CARBON	1.5K 5% 1/4W
R176	1-249-425-11	CARBON	4.7K 5% 1/4W	R263	1-249-423-11	CARBON	3.3K 5% 1/4W
R177	1-247-828-11	CARBON	750 5% 1/4W	R264	1-249-422-11	CARBON	2.7K 5% 1/4W
R178	1-249-414-11	CARBON	560 5% 1/4W	R265	1-249-433-11	CARBON	22K 5% 1/4W
R179	1-249-429-11	CARBON	10K 5% 1/4W	R266	1-249-440-11	CARBON	82K 5% 1/4W
R180	1-249-429-11	CARBON	10K 5% 1/4W	R267	1-249-407-11	CARBON	150 5% 1/4W
R182	1-249-430-11	CARBON	12K 5% 1/4W	R268	1-249-437-11	CARBON	47K 5% 1/4W
R183	1-249-421-11	CARBON	2.2K 5% 1/4W	R269	1-249-442-11	CARBON	510 5% 1/4W
R189	1-249-418-11	CARBON	1.2K 5% 1/4W	R270	1-249-424-11	CARBON	3.9K 5% 1/4W
R196	1-249-412-11	CARBON	390 5% 1/4W	R271	1-249-424-11	CARBON	3.9K 5% 1/4W
R197	1-249-406-11	CARBON	120 5% 1/4W	R274	1-249-420-11	CARBON	1.8K 5% 1/4W
R198	1-249-403-11	CARBON	68 5% 1/4W	R275	1-249-417-11	CARBON	1K 5% 1/4W
R199	1-249-437-11	CARBON	47K 5% 1/4W	R276	1-249-425-11	CARBON	4.7K 5% 1/4W
R200	1-249-432-11	CARBON	18K 5% 1/4W	R277	1-249-426-11	CARBON	5.6K 5% 1/4W
R201	1-249-417-11	CARBON	1K 5% 1/4W	R278	1-249-422-11	CARBON	2.7K 5% 1/4W
R202	1-249-417-11	CARBON	1K 5% 1/4W	R279	1-249-415-11	CARBON	680 5% 1/4W
R203	1-249-425-11	CARBON	4.7K 5% 1/4W	R280	1-249-441-11	CARBON	100K 5% 1/4W
R211	1-249-417-11	CARBON	1K 5% 1/4W	R281	1-249-428-11	CARBON	8.2K 5% 1/4W
R212	1-249-417-11	CARBON	1K 5% 1/4W	R282	1-249-421-11	CARBON	2.2K 5% 1/4W
R213	1-249-431-11	CARBON	15K 5% 1/4W	R283	1-247-892-11	CARBON	360K 5% 1/4W
R214	1-249-431-11	CARBON	15K 5% 1/4W	R284	1-249-423-11	CARBON	3.3K 5% 1/4W
R215	1-249-417-11	CARBON	1K 5% 1/4W	R285	1-247-894-11	CARBON	430K 5% 1/4W
R216	1-249-421-11	CARBON	2.2K 5% 1/4W	R286	1-247-846-11	CARBON	4.3K 5% 1/4W
R217	1-249-417-11	CARBON	1K 5% 1/4W	R287	1-249-429-11	CARBON	10K 5% 1/4W
R218	1-249-417-11	CARBON	1K 5% 1/4W	R288	1-247-891-00	CARBON	330K 5% 1/4W
R219	1-249-417-11	CARBON	1K 5% 1/4W	R289	1-249-429-11	CARBON	10K 5% 1/4W

The components identified by
mark △ or dotted line with mark
△ are critical for safety.
Replace only with part number
specified.

When indicating parts by refer-
ence number, please include
the board name.

VI-50

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R290	1-247-883-00	CARBON	150K 5% 1/4W	R413	1-249-435-11	CARBON	33K 5% 1/4W
R291	1-249-420-11	CARBON	1.8K 5% 1/4W	R414	1-249-437-11	CARBON	47K 5% 1/4W
R292	1-249-423-11	CARBON	3.3K 5% 1/4W	R415	1-249-417-11	CARBON	1K 5% 1/4W
R293	1-249-429-11	CARBON	10K 5% 1/4W	R416	1-249-417-11	CARBON	1K 5% 1/4W
R294	1-247-887-00	CARBON	220K 5% 1/4W				
R295	1-249-435-11	CARBON	33K 5% 1/4W	R418	1-249-418-11	CARBON	1.2K 5% 1/4W
R296	1-247-891-00	CARBON	330K 5% 1/4W	R419	1-249-403-11	CARBON	68 5% 1/4W
R297	1-249-434-11	CARBON	27K 5% 1/4W	R420	1-247-885-00	CARBON	180K 5% 1/4W
R298	1-249-421-11	CARBON	2.2K 5% 1/4W	R421	1-249-413-11	CARBON	470 5% 1/4W
R300	1-249-405-11	CARBON	100 5% 1/4W	R422	1-249-412-11	CARBON	390 5% 1/4W
R301	1-249-423-11	CARBON	3.3K 5% 1/4W	R423	1-247-887-00	CARBON	220K 5% 1/4W
R302	1-249-411-11	CARBON	330 5% 1/4W	R424	1-249-406-11	CARBON	120 5% 1/4W
R303	1-249-412-11	CARBON	390 5% 1/4W	R425	1-247-883-00	CARBON	150K 5% 1/4W
R304	1-249-441-11	CARBON	100K 5% 1/4W	R426	1-249-410-11	CARBON	270 5% 1/4W
R305	1-249-441-11	CARBON	100K 5% 1/4W	R427	1-249-432-11	CARBON	18K 5% 1/4W
R306	1-249-426-11	CARBON	5.6K 5% 1/4W	R428	1-249-436-11	CARBON	39K 5% 1/4W
R307	1-247-838-00	CARBON	2K 5% 1/4W	R429	1-249-430-11	CARBON	12K 5% 1/4W
R308	1-249-428-11	CARBON	8.2K 5% 1/4W	R430	1-249-423-11	CARBON	3.3K 5% 1/4W
R309	1-247-870-11	CARBON	43K 5% 1/4W	R431	1-247-832-11	CARBON	1.1K 5% 1/4W
R310	1-247-889-00	CARBON	270K 5% 1/4W	R432	1-249-423-11	CARBON	3.3K 5% 1/4W
R311	1-249-429-11	CARBON	10K 5% 1/4W	R433	1-249-421-11	CARBON	2.2K 5% 1/4W
R312	1-249-429-11	CARBON	10K 5% 1/4W	R434	1-249-432-11	CARBON	18K 5% 1/4W
R313	1-247-862-11	CARBON	20K 5% 1/4W	R435	1-249-425-11	CARBON	4.7K 5% 1/4W
R314	1-249-429-11	CARBON	10K 5% 1/4W	R436	1-249-434-11	CARBON	27K 5% 1/4W
R315	1-249-431-11	CARBON	15K 5% 1/4W	R437	1-249-431-11	CARBON	15K 5% 1/4W
R316	1-249-414-11	CARBON	560 5% 1/4W	R438	1-249-431-11	CARBON	15K 5% 1/4W
R317	1-249-414-11	CARBON	560 5% 1/4W	R439	1-249-431-11	CARBON	15K 5% 1/4W
R318	1-249-409-11	CARBON	220 5% 1/4W	R440	1-249-433-11	CARBON	22K 5% 1/4W
R319	1-249-427-11	CARBON	6.8K 5% 1/4W	R441	1-249-429-11	CARBON	10K 5% 1/4W
R320	1-249-427-11	CARBON	6.8K 5% 1/4W	R442	1-249-421-11	CARBON	2.2K 5% 1/4W
R321	1-249-414-11	CARBON	560 5% 1/4W	R443	1-249-432-11	CARBON	18K 5% 1/4W
R323	1-249-414-11	CARBON	560 5% 1/4W	R444	1-249-422-11	CARBON	2.7K 5% 1/4W
R324	1-249-422-11	CARBON	2.7K 5% 1/4W	R445	1-249-423-11	CARBON	3.3K 5% 1/4W
R331	1-249-405-11	CARBON	100 5% 1/4W	R446	1-249-427-11	CARBON	6.8K 5% 1/4W
R332	1-249-417-11	CARBON	1K 5% 1/4W	R447	1-249-436-11	CARBON	39K 5% 1/4W
R333	1-249-417-11	CARBON	1K 5% 1/4W	R448	1-249-439-11	CARBON	68K 5% 1/4W
R334	1-249-429-11	CARBON	10K 5% 1/4W	R449	1-247-888-11	CARBON	240K 5% 1/4W
R335	1-249-431-11	CARBON	15K 5% 1/4W	R450	1-249-435-11	CARBON	33K 5% 1/4W
R336	1-249-431-11	CARBON	15K 5% 1/4W	R451	1-249-433-11	CARBON	22K 5% 1/4W
R337	1-249-421-11	CARBON	2.2K 5% 1/4W	R501	1-247-887-00	CARBON	220K 5% 1/4W
R338	1-249-423-11	CARBON	3.3K 5% 1/4W	R502	1-247-887-00	CARBON	220K 5% 1/4W
R401	1-249-429-11	CARBON	10K 5% 1/4W	R503	1-247-852-11	CARBON	7.5K 5% 1/4W
R402	1-249-409-11	CARBON	220 5% 1/4W	R504	1-249-412-11	CARBON	390 5% 1/4W
R403	1-215-444-00	METAL	9.1K 1% 1/6W	R505	1-249-409-11	CARBON	220 5% 1/4W
R404	1-215-424-81	METAL	1.3K 1% 1/6W	R506	1-249-412-11	CARBON	390 5% 1/4W
R405	1-249-425-11	CARBON	4.7K 5% 1/4W	R507	1-249-430-11	CARBON	12K 5% 1/4W
R406	1-249-442-11	CARBON	510 5% 1/4W	R508	1-249-428-11	CARBON	8.2K 5% 1/4W
R407	1-249-417-11	CARBON	1K 5% 1/4W	R509	1-247-850-11	CARBON	6.2K 5% 1/4W
R408	1-249-428-11	CARBON	8.2K 5% 1/4W	R510	1-249-421-11	CARBON	2.2K 5% 1/4W
R409	1-215-423-00	METAL	1.2K 1% 1/6W	R511	1-249-417-11	CARBON	1K 5% 1/4W
R410	1-249-429-11	CARBON	10K 5% 1/4W	R512	1-249-437-11	CARBON	47K 5% 1/4W
R411	1-249-431-11	CARBON	15K 5% 1/4W	R513	1-249-406-11	CARBON	120 5% 1/4W
R412	1-249-417-11	CARBON	1K 5% 1/4W	R514	1-249-420-11	CARBON	1.8K 5% 1/4W

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description			
R515	1-249-435-11	CARBON	33K	5%	1/4W
R516	1-249-429-11	CARBON	10K	5%	1/4W
R517	1-249-429-11	CARBON	10K	5%	1/4W
R518	1-249-429-11	CARBON	10K	5%	1/4W
R519	1-249-417-11	CARBON	1K	5%	1/4W
R520	1-249-429-11	CARBON	10K	5%	1/4W
R521	1-249-421-11	CARBON	2.2K	5%	1/4W
R522	1-249-419-11	CARBON	1.5K	5%	1/4W
R523	1-247-903-00	CARBON	1M	5%	1/4W
R524	1-247-893-11	CARBON	390K	5%	1/4W
R525	1-249-418-11	CARBON	1.2K	5%	1/4W
R526	1-249-412-11	CARBON	390	5%	1/4W
R527	1-247-903-00	CARBON	1M	5%	1/4W
R528	1-249-417-11	CARBON	1K	5%	1/4W
R529	1-249-441-11	CARBON	100K	5%	1/4W
R530	1-249-417-11	CARBON	1K	5%	1/4W
R531	1-247-893-11	CARBON	390K	5%	1/4W
R532	1-247-903-00	CARBON	1M	5%	1/4W
R535	1-249-417-11	CARBON	1K	5%	1/4W
R537	1-249-430-11	CARBON	12K	5%	1/4W
R538	1-249-419-11	CARBON	1.5K	5%	1/4W
R539	1-247-881-00	CARBON	120K	5%	1/4W
R540	1-249-432-11	CARBON	18K	5%	1/4W
R541	1-249-405-11	CARBON	100	5%	1/4W
R542	1-249-417-11	CARBON	1K	5%	1/4W
R543	1-249-404-00	CARBON	82	5%	1/4W
R544	1-247-806-11	CARBON	91	5%	1/4W
R545	1-249-414-11	CARBON	560	5%	1/4W
R546	1-249-403-11	CARBON	68	5%	1/4W
R547	1-249-421-11	CARBON	2.2K	5%	1/4W
R548	1-249-417-11	CARBON	1K	5%	1/4W
R550	1-249-430-11	CARBON	12K	5%	1/4W
R551	1-249-431-11	CARBON	15K	5%	1/4W
R552	1-212-853-00	FUSIBLE	6.8	5%	1/4W
R553	1-249-421-11	CARBON	2.2K	5%	1/4W
R554	1-249-429-11	CARBON	10K	5%	1/4W
R555	1-249-425-11	CARBON	4.7K	5%	1/4W
R556	1-249-429-11	CARBON	10K	5%	1/4W
R558	1-249-429-11	CARBON	10K	5%	1/4W
R559	1-249-429-11	CARBON	10K	5%	1/4W
R561	1-249-411-11	CARBON	330	5%	1/4W
R562	1-249-416-11	CARBON	820	5%	1/4W
R566	1-249-419-11	CARBON	1.5K	5%	1/4W
R568	1-249-431-11	CARBON	15K	5%	1/4W
R569	1-249-428-11	CARBON	8.2K	5%	1/4W
R570	1-249-429-11	CARBON	10K	5%	1/4W
R571	1-249-429-11	CARBON	10K	5%	1/4W
R572	1-249-417-11	CARBON	1K	5%	1/4W
R573	1-247-903-00	CARBON	1M	5%	1/4W
R574	1-247-899-11	CARBON	680K	5%	1/4W

Ref.No	Part No.	Description	Remark
R577	1-249-433-11	CARBON	22K 5% 1/4W
R578	1-249-436-11	CARBON	39K 5% 1/4W
R579	1-249-425-11	CARBON	4.7K 5% 1/4W
R580	1-249-421-11	CARBON	2.2K 5% 1/4W
VARIABLE RESISTOR			
RV001	1-228-996-00	RES, ADJ, CARBON	47K
RV002	1-228-990-00	RES, ADJ, CARBON	1K
RV009	1-228-994-00	RES, ADJ, CARBON	10K
RV015	1-228-991-00	RES, ADJ, CARBON	2.2K
RV016	1-228-996-00	RES, ADJ, CARBON	47K
RV017	1-228-990-00	RES, ADJ, CARBON	1K
RV018	1-228-994-00	RES, ADJ, CARBON	10K
RV019	1-228-995-00	RES, ADJ, CARBON	22K
RV020	1-228-996-00	RES, ADJ, CARBON	47K
RV021	1-228-994-00	RES, ADJ, CARBON	10K
RV022	1-228-996-00	RES, ADJ, CARBON	47K
RV025	1-228-990-00	RES, ADJ, CARBON	1K
RV026	1-228-990-00	RES, ADJ, CARBON	1K
RV401	1-228-996-00	RES, ADJ, CARBON	47K
RV402	1-228-996-00	RES, ADJ, CARBON	47K
RV403	1-228-994-00	RES, ADJ, CARBON	10K
RV404	1-228-993-00	RES, ADJ, CARBON	4.7K
RV405	1-228-989-00	RES, ADJ, CARBON	470
RV406	1-228-991-00	RES, ADJ, CARBON	2.2K
RV407	1-228-989-00	RES, ADJ, CARBON	470
RV408	1-228-989-00	RES, ADJ, CARBON	470
RV409	1-228-993-00	RES, ADJ, CARBON	4.7K
RV501	1-228-990-00	RES, ADJ, CARBON	1K
RV502	1-228-990-00	RES, ADJ, CARBON	1K
TRANSFORMER			
T001	1-426-093-00	COIL, REC C BPT	
T002	1-426-305-11	TRANSFORMER, EQUALIZER	
T003	1-426-327-11	EQT	
CRYSTAL			
X001	1-567-504-11	OSCILLATOR, CRYSTAL	(4.43MHz)
X002	1-567-505-11	OSCILLATOR, CRYSTAL	(3.58MHz)
X501	1-577-238-11	VIBRATOR, CRYSTAL	(12.73MHz)
X502	1-577-237-11	VIBRATOR, CRYSTAL	(12.77MHz)

*A-6710-989-A VC-52 BOARD, COMPLETE			

BAND PASS FILTER			
BPF801	1-235-979-11	BPF	
BPF802	1-235-986-11	FILTER, BAND PASS	
CAPACITOR			
C801	1-123-356-00	ELECT	10MF 20% 16V
C802	1-162-560-11	CERAMIC	0.047MF 16V

The components identified by mark **A** or dotted line with mark **A** are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C803	1-161-379-00	CERAMIC	0.01MF 30% 16V	<u>DELAY LINE</u>			
C805	1-162-560-11	CERAMIC	0.047MF 16V	DL801	1-415-438-11	DELAY LINE (1H)	
C806	1-161-043-00	CERAMIC	0.0022MF 10% 25V	DL802	1-415-533-11	DELAY LINE, 1H ULTRASONIC	
C807	1-161-379-00	CERAMIC	0.01MF 30% 16V	DL803	1-415-439-11	DELAY LINE (1H)	
C808	1-124-446-11	ELECT	47MF 20% 10V	<u>IC</u>			
C809	1-102-961-00	CERAMIC	27PF 5% 50V	<u>IC</u>			
C810	1-161-379-00	CERAMIC	0.01MF 30% 16V	IC801	8-759-208-94	IC CX-894	
C811	1-161-379-00	CERAMIC	0.01MF 30% 16V	IC802	8-759-208-94	IC CX-894	
C812	1-126-176-11	ELECT	220MF 20% 6.3V	IC803	8-759-804-59	IC LA7311	
C813	1-161-379-00	CERAMIC	0.01MF 30% 16V	<u>COIL</u>			
C814	1-161-379-00	CERAMIC	0.01MF 30% 16V	L801	1-410-508-21	INDUCTOR 8.2UH	
C815	1-101-884-00	CERAMIC	56PF 5% 50V	L802	1-410-511-21	INDUCTOR 15UH	
C816	1-162-560-11	CERAMIC	0.047MF 16V	L803	1-410-508-21	INDUCTOR 8.2UH	
C817	1-161-379-00	CERAMIC	0.01MF 30% 16V	<u>VARIABLE COIL</u>			
C818	1-161-379-00	CERAMIC	0.01MF 30% 16V	LV801	1-408-532-00	COIL, VARIABLE	
C819	1-161-379-00	CERAMIC	0.01MF 30% 16V	LV802	1-408-520-00	COIL, VARIABLE	
C820	1-162-851-11	CERAMIC	0.1MF 16V	LV803	1-408-512-00	COIL (VARIABLE)	
C821	1-126-176-11	ELECT	220MF 20% 6.3V	LV804	1-408-513-00	COIL (VARIABLE)	
C822	1-162-201-31	CERAMIC	12PF 5% 50V	LV805	1-408-512-00	COIL (VARIABLE)	
C823	1-161-379-00	CERAMIC	0.01MF 30% 16V	<u>TRANSISTOR</u>			
C824	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q801	8-729-117-54	TRANSISTOR 2SA1175-F	
C825	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q802	8-729-178-54	TRANSISTOR 2SC2785-F	
C826	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q803	8-729-178-54	TRANSISTOR 2SC2785-F	
C827	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q804	8-729-178-54	TRANSISTOR 2SC2785-F	
C828	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q805	8-729-117-54	TRANSISTOR 2SA1175-F	
C829	1-162-851-11	CERAMIC	0.1MF 16V	Q806	8-729-178-54	TRANSISTOR 2SC2785-F	
C830	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q807	8-729-178-54	TRANSISTOR 2SC2785-F	
C831	1-124-963-11	ELECT	33MF 20% 16V	Q808	8-729-178-54	TRANSISTOR 2SC2785-F	
C832	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q809	8-729-900-89	TRANSISTOR DTC144ES	
C833	1-124-925-11	ELECT	2.2MF 20% 50V	Q810	8-729-900-89	TRANSISTOR DTC144ES	
C834	1-124-472-11	ELECT	470MF 20% 6.3V	Q811	8-729-117-54	TRANSISTOR 2SA1175-F	
C835	1-124-925-11	ELECT	2.2MF 20% 50V	Q812	8-729-900-89	TRANSISTOR DTC144ES	
C836	1-162-560-11	CERAMIC	0.047MF 16V	Q813	8-729-178-54	TRANSISTOR 2SC2785-F	
C837	1-162-203-31	CERAMIC	15PF 5% 50V	Q814	8-729-178-54	TRANSISTOR 2SC2785-F	
C838	1-124-446-11	ELECT	47MF 20% 10V	Q815	8-729-117-54	TRANSISTOR 2SA1175-F	
C861	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q816	8-729-178-54	TRANSISTOR 2SC2785-F	
C862	1-161-379-00	CERAMIC	0.01MF 30% 16V	Q817	8-729-178-54	TRANSISTOR 2SC2785-F	
C863	1-161-379-00	CERAMIC	0.01MF 30% 16V	<u>RESISTOR</u>			
C866	1-161-379-00	CERAMIC	0.01MF 30% 16V	R801	1-249-421-11	CARBON 2.2K 5% 1/4W	
<u>PIN</u>				R802	1-249-417-11	CARBON 1K 5% 1/4W	
CL801	*3-695-075-01	PIN, LEAD, COATING		R803	1-249-435-11	CARBON 33K 5% 1/4W	
CL802	*3-695-075-01	PIN, LEAD, COATING		R804	1-249-433-11	CARBON 22K 5% 1/4W	
<u>CONNECTOR</u>				R805	1-249-414-11	CARBON 560 5% 1/4W	
CN801	*1-560-899-00	PIN, CONNECTOR 11P		R806	1-249-414-11	CARBON 560 5% 1/4W	
CN802	*1-560-896-00	PIN, CONNECTOR 8P		R807	1-249-417-11	CARBON 1K 5% 1/4W	
<u>DIODE</u>				R808	1-249-434-11	CARBON 27K 5% 1/4W	
D801	8-719-911-19	DIODE 1SS119		R809	1-249-431-11	CARBON 15K 5% 1/4W	
				R810	1-249-405-11	CARBON 100 5% 1/4W	
				R811	1-249-426-11	CARBON 5.6K 5% 1/4W	
				R812	1-249-427-11	CARBON 6.8K 5% 1/4W	
				R813	1-249-413-11	CARBON 470 5% 1/4W	
				R814	1-247-800-11	CARBON 51 5% 1/4W	
				R815	1-249-415-11	CARBON 680 5% 1/4W	

When indicating parts by reference number, please include the board name.

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When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
IC702	8-759-220-04	IC TC40H004P		Q709	8-729-806-32	TRANSISTOR 2SC3860	
IC901	8-759-805-20	IC LA7297		Q710	8-729-806-32	TRANSISTOR 2SC3860	
				Q901	8-729-801-93	TRANSISTOR 2SD1387	
				Q902	8-729-303-37	TRANSISTOR 2SD655-E	

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Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
R320	1-249-423-11	CARBON	3.3K 5% 1/4W	R377	1-249-417-11	CARBON	1K 5% 1/4W
R321	1-247-889-00	CARBON	270K 5% 1/4W	R378	1-249-423-11	CARBON	3.3K 5% 1/4W
R322	1-249-421-11	CARBON	2.2K 5% 1/4W	R379	1-216-349-00	METAL OXIDE	1 5% 1W F
R323	1-215-465-00	METAL	68K 1% 1/6W	R380	1-216-349-00	METAL OXIDE	1 5% 1W F
R324	1-249-436-11	CARBON	39K 5% 1/4W	R381	1-249-423-11	CARBON	3.3K 5% 1/4W
R325	1-249-434-11	CARBON	27K 5% 1/4W	R382	1-249-421-11	CARBON	2.2K 5% 1/4W
R327	1-249-429-11	CARBON	10K 5% 1/4W	R383	1-247-891-00	CARBON	330K 5% 1/4W
R328	1-249-437-11	CARBON	47K 5% 1/4W	R384	1-249-425-11	CARBON	4.7K 5% 1/4W
R329	1-249-429-11	CARBON	10K 5% 1/4W	R385	1-249-425-11	CARBON	4.7K 5% 1/4W
R330	1-249-433-11	CARBON	22K 5% 1/4W	R704	1-247-895-00	CARBON	470K 5% 1/4W
R331	1-249-421-11	CARBON	2.2K 5% 1/4W	R705	1-249-429-11	CARBON	10K 5% 1/4W
R332	1-249-434-11	CARBON	27K 5% 1/4W	R706	1-249-435-11	CARBON	33K 5% 1/4W
R333	1-249-436-11	CARBON	39K 5% 1/4W	R707	1-249-433-11	CARBON	22K 5% 1/4W
R334	1-249-434-11	CARBON	27K 5% 1/4W	R708	1-249-421-11	CARBON	2.2K 5% 1/4W
R335	1-249-425-11	CARBON	4.7K 5% 1/4W	R709	1-249-421-11	CARBON	2.2K 5% 1/4W
R336	1-247-887-00	CARBON	220K 5% 1/4W	R710	1-249-421-11	CARBON	2.2K 5% 1/4W
R337	1-249-434-11	CARBON	27K 5% 1/4W	R711	1-249-406-11	CARBON	120 5% 1/4W
R338	1-249-430-11	CARBON	12K 5% 1/4W	R713	1-249-426-11	CARBON	5.6K 5% 1/4W
R339	1-249-416-11	CARBON	820 5% 1/4W	R714	1-249-434-11	CARBON	27K 5% 1/4W
R340	1-249-419-11	CARBON	1.5K 5% 1/4W	R715	1-249-417-11	CARBON	1K 5% 1/4W
R342	1-249-411-11	CARBON	330 5% 1/4W	R716	1-249-429-11	CARBON	10K 5% 1/4W
R343	1-249-416-11	CARBON	820 5% 1/4W	R718	1-249-425-11	CARBON	4.7K 5% 1/4W
R344	1-249-418-11	CARBON	1.2K 5% 1/4W	R719	1-249-430-11	CARBON	12K 5% 1/4W
R345	1-249-411-11	CARBON	330 5% 1/4W	R720	1-249-424-11	CARBON	3.9K 5% 1/4W
R346	1-249-433-11	CARBON	22K 5% 1/4W	R901	1-249-429-11	CARBON	10K 5% 1/4W
R347	1-249-427-11	CARBON	6.8K 5% 1/4W	R902	1-249-429-11	CARBON	10K 5% 1/4W
R348	1-249-429-11	CARBON	10K 5% 1/4W	R903	1-249-431-11	CARBON	15K 5% 1/4W
R349	1-249-419-11	CARBON	1.5K 5% 1/4W	R904	1-249-387-11	CARBON	3.3 5% 1/4W
R350	1-247-883-00	CARBON	150K 5% 1/4W	R905	1-249-393-11	CARBON	10 5% 1/4W
R351	1-249-431-11	CARBON	15K 5% 1/4W	R906	1-249-429-11	CARBON	10K 5% 1/4W
R352	1-249-433-11	CARBON	22K 5% 1/4W	R907	1-249-439-11	CARBON	68K 5% 1/4W
R353	1-249-431-11	CARBON	15K 5% 1/4W	R908	1-249-421-11	CARBON	2.2K 5% 1/4W
R354	1-249-424-11	CARBON	3.9K 5% 1/4W	R909	1-249-421-11	CARBON	2.2K 5% 1/4W
R355	1-249-425-11	CARBON	4.7K 5% 1/4W	R910	1-249-416-11	CARBON	820 5% 1/4W
R356	1-247-891-00	CARBON	330K 5% 1/4W	R911	1-249-410-11	CARBON	270 5% 1/4W
R357	1-247-885-00	CARBON	180K 5% 1/4W	R912	1-249-430-11	CARBON	12K 5% 1/4W
R358	1-249-423-11	CARBON	3.3K 5% 1/4W	R913	1-247-889-00	CARBON	270K 5% 1/4W
R359	1-249-437-11	CARBON	47K 5% 1/4W	R914	1-249-414-11	CARBON	560 5% 1/4W
R360	1-249-441-11	CARBON	100K 5% 1/4W	R915	1-249-425-11	CARBON	4.7K 5% 1/4W
R361	1-249-426-11	CARBON	5.6K 5% 1/4W	R916	1-247-852-11	CARBON	7.5K 5% 1/4W
R362	1-249-438-11	CARBON	56K 5% 1/4W	R917	1-249-423-11	CARBON	3.3K 5% 1/4W
R363	1-249-429-11	CARBON	10K 5% 1/4W	R918	1-249-418-11	CARBON	1.2K 5% 1/4W
R364	1-249-440-11	CARBON	82K 5% 1/4W	R919	1-249-435-11	CARBON	33K 5% 1/4W
R365	1-215-438-00	METAL	5.1K 1% 1/6W	R920	1-249-414-11	CARBON	560 5% 1/4W
R368	1-249-433-11	CARBON	22K 5% 1/4W	R921	1-247-903-00	CARBON	1M 5% 1/4W
R369	1-215-439-00	METAL	5.6K 1% 1/6W	R922	1-249-437-11	CARBON	47K 5% 1/4W
R370	1-249-441-11	CARBON	100K 5% 1/4W	R923	1-249-429-11	CARBON	10K 5% 1/4W
R371	1-249-439-11	CARBON	68K 5% 1/4W	R924	1-249-432-11	CARBON	18K 5% 1/4W
R372	1-249-430-11	CARBON	12K 5% 1/4W	R925	1-249-413-11	CARBON	470 5% 1/4W
R373	1-249-437-11	CARBON	47K 5% 1/4W	R926	1-249-427-11	CARBON	6.8K 5% 1/4W
R374	1-249-441-11	CARBON	100K 5% 1/4W	R928	1-249-429-11	CARBON	10K 5% 1/4W
R375	1-247-899-11	CARBON	680K 5% 1/4W	R929	1-249-417-11	CARBON	1K 5% 1/4W
R376	1-249-405-11	CARBON	100 5% 1/4W				

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
<u>VARIABLE RESISTOR</u>							
RV301	1-228-996-00	RES, ADJ, METAL GLAZE 47K		C728	1-123-330-00	ELECT 22MF 20% 16V	
RV302	1-228-996-00	RES, ADJ, METAL GLAZE 47K		C729	1-102-953-00	CERAMIC 18PF 5% 50V	
RV303	1-228-996-00	RES, ADJ, CARBON 47K		C730	1-161-377-00	CERAMIC 0.0047MF 30% 16V	
RV304	1-228-996-00	RES, ADJ, CARBON 47K		C731	1-161-061-11	CERAMIC 0.068MF 10% 50V	
RV305	1-228-998-00	RES, ADJ, METAL GLAZE 220K		C732	1-161-375-00	CERAMIC 0.0022MF 30% 16V	
RV306	1-228-995-00	RES, ADJ, CARBON 22K		C733	1-161-379-00	CERAMIC 0.01MF 30% 16V	
RV307	1-228-995-00	RES, ADJ, CARBON 22K		C735	1-161-055-00	CERAMIC 0.022MF 10% 50V	
RV308	1-228-996-00	RES, ADJ, METAL GLAZE 47K		C736	1-124-499-11	ELECT 1MF 20% 50V	
RV309	1-228-995-00	RES, ADJ, CARBON 22K		C738	1-162-294-31	CERAMIC 0.001MF 10% 50V	
RV310	1-228-994-00	RES, ADJ, METAL GLAZE 10K		C739	1-161-379-00	CERAMIC 0.01MF 30% 16V	
RV311	1-228-994-00	RES, ADJ, METAL GLAZE 10K		C741	1-161-379-00	CERAMIC 0.01MF 30% 16V	
RV312	1-228-995-00	RES, ADJ, CARBON 22K		C744	1-123-330-00	ELECT 22MF 20% 16V	
RV901	1-228-998-00	RES, ADJ, CARBON 220K		C745	1-102-824-00	CERAMIC 470PF 5% 50V	
<u>TRANSFORMER</u>				C746	1-102-822-00	CERAMIC 390PF 5% 50V	
T901	1-433-319-11	TRANSFORMER, BIAS OSCILLATION		C747	1-102-953-00	CERAMIC 18PF 5% 50V	
<u>CRYSTAL</u>				C749	1-161-379-00	CERAMIC 0.01MF 30% 16V	
X001	1-567-519-11	VIBRATOR, CRYSTAL (4.19MHz)		C751	1-124-472-11	ELECT 470MF 20% 10V	
*****				C752	1-161-379-00	CERAMIC 0.01MF 30% 16V	
*A-6721-292-A TU-95 BOARD, COMPLETE				C753	1-101-880-00	CERAMIC 47PF 5% 50V	
*****				C754	1-101-880-00	CERAMIC 47PF 5% 50V	
<u>CAPACITOR</u>				C760	1-124-963-11	ELECT 33MF 20% 16V	
C701	1-123-330-00	ELECT 22MF 20% 16V		C798	1-102-822-00	CERAMIC 390PF 5% 50V	
C702	1-130-495-00	MYLAR 0.1MF 5% 50V		C799	1-161-039-00	CERAMIC 0.001MF 10% 25V	
C703	1-130-495-00	MYLAR 0.1MF 5% 50V		<u>FILTER</u>			
C704	1-130-495-00	MYLAR 0.1MF 5% 50V		CF701	1-404-469-00	DISCRIMINATOR, CERAMIC (4.5MHz)	
C705	1-162-284-31	CERAMIC 150PF 10% 50V		CF702	1-404-473-00	DISCRIMINATOR, CERAMIC (5.5MHz)	
C707	1-124-917-11	ELECT 33MF 20% 63V		CF703	1-527-943-00	FILTER, CERAMIC (4.5MHz)	
C708	1-124-555-91	ELECT 1000MF 20% 16V		CF704	1-567-099-00	FILTER, CERAMIC (5.5MHz)	
C709	1-161-377-00	CERAMIC 0.0047MF 30% 16V		CF705	1-409-332-00	CERAMIC TRAP (4.5MHz)	
C710	1-102-942-00	CERAMIC 5PF 0.5PF 50V		CF706	1-404-134-00	TRAP, CERAMIC (5.5MHz)	
C711	1-101-880-00	CERAMIC 47PF 5% 50V		<u>CONNECTOR</u>			
C712	1-102-951-00	CERAMIC 15PF 5% 50V		CN701	*1-563-590-11	CONNECTOR, FLEXIBLE 13P	
C713	1-161-377-00	CERAMIC 0.0047MF 30% 16V		CN702	*1-560-894-00	PIN, CONNECTOR 6P	
C714	1-161-379-00	CERAMIC 0.01MF 30% 16V		<u>DIODE</u>			
C715	1-102-953-00	CERAMIC 18PF 5% 50V		D702	8-719-100-35	DIODE RD5.6EB2	
C716	1-101-880-00	CERAMIC 47PF 5% 50V		D703	8-719-911-19	DIODE 1SS119	
C717	1-102-945-00	CERAMIC 8PF 0.5PF 50V		D704	8-719-911-19	DIODE 1SS119	
C719	1-161-377-00	CERAMIC 0.0047MF 30% 16V		<u>IC</u>			
C720	1-161-377-00	CERAMIC 0.0047MF 30% 16V		IC701	8-759-157-40	IC UPC574J	
C721	1-124-902-00	ELECT 0.47MF 20% 50V		IC702	8-752-001-51	IC CX20015A	
C722	1-161-375-00	CERAMIC 0.0022MF 30% 16V		<u>COIL</u>			
C723	1-161-379-00	CERAMIC 0.01MF 30% 16V		L702	1-410-316-11	INDUCTOR 1UH	
C724	1-161-379-00	CERAMIC 0.01MF 30% 16V		L704	1-408-408-00	INDUCTOR 8.2UH	
C725	1-101-888-00	CERAMIC 68PF 5% 50V		L706	1-408-414-00	INDUCTOR 27UH	
C726	1-161-055-00	CERAMIC 0.022MF 10% 25V		L708	1-408-413-00	INDUCTOR 22UH	
C727	1-101-888-00	CERAMIC 68PF 5% 50V		L709	1-408-402-00	INDUCTOR 2.7UH	
				L710	1-408-401-00	INDUCTOR 2.2UH	
				L711	1-408-412-00	INDUCTOR 18UH	
				L712	1-408-411-00	INDUCTOR 15UH	
				L713	1-410-317-21	INDUCTOR 1.2UH	
				L714	1-408-411-00	INDUCTOR 15UH	

When indicating parts by reference number, please include the board name.

TU-95**PS-187**

Ref.No	Part No.	Description
L715	1-408-411-00	INDUCTOR 15UH
L797	1-410-320-41	INDUCTOR 2.2UH

TRANSISTOR

Q701	8-729-900-61	TRANSISTOR DTA114ES
Q702	8-729-900-80	TRANSISTOR DTC114ES
Q703	8-729-900-61	TRANSISTOR DTA114ES
Q704	8-729-900-80	TRANSISTOR DTC114ES
Q705	8-729-900-61	TRANSISTOR DTA114ES
Q706	8-729-900-80	TRANSISTOR DTC114ES
Q707	8-729-603-30	TRANSISTOR 2SC403SP-3
Q708	8-729-600-27	TRANSISTOR 2SC2603
Q709	8-729-266-93	TRANSISTOR 2SC2669-0
Q710	8-729-600-27	TRANSISTOR 2SC2603
Q711	8-729-801-93	TRANSISTOR 2SD1387
Q712	8-729-900-36	TRANSISTOR DTC124ES
Q713	8-729-900-36	TRANSISTOR DTC124ES
Q714	8-729-600-27	TRANSISTOR 2SC2603
Q715	8-729-600-27	TRANSISTOR 2SC2603
Q716	8-729-600-27	TRANSISTOR 2SC2603
Q717	8-729-600-27	TRANSISTOR 2SC2603
Q720	8-729-117-54	TRANSISTOR 2SA1175-F
Q721	8-729-117-54	TRANSISTOR 2SA1175-F
Q722	8-729-900-89	TRANSISTOR DTC144ES
Q724	8-729-900-89	TRANSISTOR DTC144ES
Q725	8-729-806-08	TRANSISTOR 2SA1511

RESISTOR

R701	1-249-433-11	CARBON	22K	5%	1/4W
R702	1-249-433-11	CARBON	22K	5%	1/4W
R703	1-249-433-11	CARBON	22K	5%	1/4W
R704	1-249-429-11	CARBON	10K	5%	1/4W
R705	1-249-429-11	CARBON	10K	5%	1/4W
R706	1-249-429-11	CARBON	10K	5%	1/4W
R707	1-249-416-11	CARBON	820	5%	1/4W
R708	1-249-417-11	CARBON	1K	5%	1/4W
R709	1-249-418-11	CARBON	1.2K	5%	1/4W
R710	1-249-410-11	CARBON	270	5%	1/4W
R711	1-249-417-11	CARBON	1K	5%	1/4W
R712	1-249-402-11	CARBON	56	5%	1/4W
R713	1-249-403-11	CARBON	68	5%	1/4W
R714	1-249-417-11	CARBON	1K	5%	1/4W
R715	1-249-421-11	CARBON	2.2K	5%	1/4W
R716	1-249-430-11	CARBON	12K	5%	1/4W
R717	1-249-429-11	CARBON	10K	5%	1/4W
R718	1-249-409-11	CARBON	220	5%	1/4W
R719	1-249-423-11	CARBON	3.3K	5%	1/4W
R720	1-247-883-00	CARBON	150K	5%	1/4W
R721	1-247-883-00	CARBON	150K	5%	1/4W
R722	1-249-423-11	CARBON	3.3K	5%	1/4W
R723	1-249-429-11	CARBON	10K	5%	1/4W
R724	1-249-433-11	CARBON	22K	5%	1/4W
R725	1-249-433-11	CARBON	22K	5%	1/4W

Ref.No	Part No.	Description	Remark
R726	1-249-421-11	CARBON	2.2K 5% 1/4W
R727	1-249-421-11	CARBON	2.2K 5% 1/4W
R729	1-249-417-11	CARBON	1K 5% 1/4W
R730	1-249-413-11	CARBON	470 5% 1/4W
R731	1-249-419-11	CARBON	1.5K 5% 1/4W

R733	1-249-417-11	CARBON	1K 5% 1/4W
R735	1-249-433-11	CARBON	22K 5% 1/4W
R736	1-249-417-11	CARBON	1K 5% 1/4W
R737	1-249-417-11	CARBON	1K 5% 1/4W
R738	1-249-417-11	CARBON	1K 5% 1/4W

R739	1-249-414-11	CARBON	560 5% 1/4W
R740	1-249-433-11	CARBON	22K 5% 1/4W
R741	1-249-433-11	CARBON	22K 5% 1/4W
R742	1-249-412-11	CARBON	390 5% 1/4W
R743	1-249-411-11	CARBON	330 5% 1/4W

R744	1-249-409-11	CARBON	220 5% 1/4W
R749	1-249-405-11	CARBON	100 5% 1/4W
R750	1-249-405-11	CARBON	100 5% 1/4W
R751	1-249-410-11	CARBON	270 5% 1/4W
R752	1-249-417-11	CARBON	1K 5% 1/4W

R753	1-247-804-11	CARBON	75 5% 1/4W
R755	1-249-425-11	CARBON	4.7K 5% 1/4W
R758	1-249-438-11	CARBON	56K 5% 1/4W
R759	1-249-429-11	CARBON	10K 5% 1/4W
R760	1-249-429-11	CARBON	10K 5% 1/4W
R761	1-212-853-51	FUSIBLE	6.8 5% 1/4W

VARIABLE RESISTOR

RV701	1-228-993-00	RES, ADJ, CARBON 4.7K
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SAWF

SF701	1-404-563-11	SAWF
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TRANSFORMER

T701	1-404-489-00	COIL
T702	1-404-489-00	COIL
T703	1-404-465-00	COIL, VIF (MOLD TYPE)
T704	1-404-465-00	COIL, VIF (MOLD TYPE)

TUNER

TU701	1-463-848-11	TUNER, ET (BT-886A)
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*A-6722-381-A PS-187 BOARD, COMPLETE

*1-533-189-11 HOLDER, FUSE
7-685-647-79 SCREW +BVTP 3X10 TYPE2 1T-3
7-685-647-79 SCREW +BVTP 3X10 TYPE2

CAPACITOR

C601	1-164-194-12	CERAMIC	0.0047MF	20%	400V
C602	1-164-194-12	CERAMIC	0.0047MF	20%	400V
C604	1-136-548-11	FILM	0.1MF	20%	250V

The components identified by
mark **A** or dotted line with mark
A are critical for safety.
Replace only with part number
specified.

When indicating parts by refer-
ence number, please include
the board name.

PS-187

PS-196

RP-70

Ref.No	Part No.	Description			Remark	Ref.No	Part No.	Description			Remark
C605	1-130-804-61	FILM	0.047MF	10%	400V	R610	△ 1-212-849-00	FUSIBLE	4.7	5%	1/4W F
C606	△ 1-126-539-11	ELECT	100MF		400V	R611	△ 1-212-849-00	FUSIBLE	4.7	5%	1/4W F
C607	1-136-165-00	MYLAR	0.1MF	10%	50V	R612	△ 1-212-853-00	FUSIBLE	6.8	5%	1/4W F
C608	1-124-597-11	ELECT	2200MF	20%	16V	R614	△ 1-217-312-00	WIREWOUND	150	10%	5W F
C609	1-124-597-11	ELECT	2200MF	20%	16V	R615	△ 1-202-727-00	SOLID	4.7M	10%	1/2W
C610	1-124-513-11	ELECT	47MF	20%	50V	R617	1-249-418-11	CARBON	1.2K	5%	1/4W
C611	1-124-513-11	ELECT	47MF	20%	50V	R619	1-249-409-11	CARBON	220	5%	1/4W
C612	1-161-051-00	CERAMIC	0.01MF	10%	25V	R620	1-249-410-11	CARBON	270	5%	1/4W
C613	1-123-330-00	ELECT	22MF	20%	25V	R621	1-249-410-11	CARBON	270	5%	1/4W
C614	1-136-165-00	MYLAR	0.1MF	10%	50V						
C616	1-162-826-11	CERAMIC	220PF	10%	6.3KV						
C617	1-130-483-00	MYLAR	0.01MF	5%	50V						
C618	△ 1-136-548-11	FILM	0.1MF	20%	250V						
C619	1-124-963-11	ELECT	33MF	20%	16V						
C622	1-161-074-91	CERAMIC	0.047MF	20%	50V						
C623	1-161-021-11	CERAMIC	0.047MF	20%	25V						
C624	1-161-021-11	CERAMIC	0.047MF	20%	25V						
C625	1-164-159-11	CERAMIC	0.1MF		50V						
	<u>DIODE</u>										
D601	△ 8-719-510-06	DIODE S1WB60									
D602	8-719-500-66	DIODE S3LA20									
D603	8-719-510-08	DIODE D1NK20H-TA									
D604	8-719-510-08	DIODE D1NK20H-TA									
D605	8-719-510-08	DIODE D1NK20H-TA									
D606	△ 8-719-931-20	DIODE EQB01-20									
D607	8-719-100-38	DIODE RD6.2E-B3									
D608	8-719-160-23	DIODE RD5.1FB2									
D609	8-719-200-23	DIODE 11E2									
	<u>FUSE</u>										
F601	△ 1-532-259-00	FUSE, TIME-LAG (1.6A 250V)									
	<u>IC</u>										
IC601	△ 8-759-977-63	IC MA2830									
IC602	8-719-820-10	DIODE TLP624									
IC603	8-759-914-44	IC TL431CLPB									
	<u>COIL</u>										
L601	△ 1-421-922-11	FILTER, LINE 10mH									
L602	1-412-078-11	INDUCTOR 10UH									
	<u>TRANSISTOR</u>										
Q601	8-729-904-27	TRANSISTOR 2SD1761-E									
Q604	8-729-178-54	TRANSISTOR 2SC2785-F									
	<u>RESISTOR</u>										
R601	△ 1-215-902-11	METAL OXIDE	47K	5%	2W F						
R602	1-244-941-00	CARBON	680K	5%	1/2W						
R603	△ 1-217-310-11	WIREWOUND	100	10%	5W F						
R604	△ 1-247-819-00	CARBON	330	5%	1/4W						
R605	△ 1-215-886-11	METAL OXIDE	100	5%	2W F						
R606	1-249-421-11	CARBON	2.2K	5%	1/4W						
R607	1-249-405-11	CARBON	100	5%	1/4W						
R608	1-249-428-11	CARBON	8.2K	5%	1/4W						
R609	△ 1-212-849-00	FUSIBLE	4.7	5%	1/4W F						

The components identified by mark  or dotted line with mark  are critical for safety. Replace only with part number specified.

When indicating parts by reference number, please include the board name.

RP-70 FF-25

Ref.No	Part No.	Description	Remark	Ref.No	Part No.	Description	Remark
C012	1-162-215-31	CERAMIC 47PF	5% 50V	R008	1-249-414-11	CARBON 560	5% 1/4W
C013	1-162-212-31	CERAMIC 36PF	5% 50V	R010	1-249-417-11	CARBON 1K	5% 1/4W
C015	1-124-589-11	ELECT 47MF	20% 10V	R011	1-247-846-11	CARBON 4.3K	5% 1/4W
C016	1-161-379-00	CERAMIC 0.01MF	30% 16V	R012	1-249-427-11	CARBON 6.8K	5% 1/4W
C017	1-126-154-11	ELECT 47MF	20% 6.3V	R013	1-249-429-11	CARBON 10K	5% 1/4W
C018	1-161-379-00	CERAMIC 0.01MF	30% 16V	R014	1-249-429-11	CARBON 10K	5% 1/4W
C020	1-161-379-00	CERAMIC 0.01MF	30% 16V	R015	1-249-405-11	CARBON 100	5% 1/4W
C021	1-164-068-11	CERAMIC 82PF	5% 50V	R016	1-249-416-11	CARBON 820	5% 1/4W
C022	1-164-081-11	CERAMIC 470PF	10% 50V	R017	1-249-406-11	CARBON 120	5% 1/4W
C023	1-162-218-31	CERAMIC 62PF	5% 50V	R018	1-249-429-11	CARBON 10K	5% 1/4W
C024	1-161-379-00	CERAMIC 0.01MF	30% 16V	R019	1-249-417-11	CARBON 1K	5% 1/4W
C025	1-161-379-00	CERAMIC 0.01MF	30% 16V	R020	1-249-405-11	CARBON 100	5% 1/4W F
C026	1-161-379-00	CERAMIC 0.01MF	30% 16V	R051	1-249-434-11	CARBON 27K	5% 1/4W
C027	1-161-379-00	CERAMIC 0.01MF	30% 16V	R052	1-249-431-11	CARBON 15K	5% 1/4W
C029	1-102-947-00	CERAMIC 10PF	5% 50V	R053	1-249-421-11	CARBON 2.2K	5% 1/4W
C051	1-161-379-00	CERAMIC 0.01MF	30% 16V	R054	1-249-432-11	CARBON 18K	5% 1/4W
C052	1-161-379-00	CERAMIC 0.01MF	30% 16V	R055	1-249-431-11	CARBON 15K	5% 1/4W
<u>CONNECTOR</u>				<u>VARIABLE RESISTOR</u>			
CN001	*1-560-894-00	PIN, CONNECTOR 6P		RV001	1-230-720-11	RES, ADJ, CARBON 4.7K	
CN002	*1-564-029-00	PIN, CONNECTOR 4P		*****			
<u>DIODE</u>				*1-628-161-11 FF-25 BOARD *****			
D001	8-719-911-19	DIODE 1SS119		<u>CONNECTOR</u>			
<u>IC</u>				CN501	1-563-630-11	CONNECTOR, FLEXIBLE 27P	
IC001	8-759-820-98	IC LA7320		CN503	1-565-776-11	CONNECTOR, BOARD TO BOARD 4P	
<u>COIL</u>				<u>DIODE</u>			
L001	1-410-511-21	INDUCTOR 15UH		D502	8-719-802-02	DIODE TLY113AP (PAUSE)	
L002	1-410-509-11	INDUCTOR 10UH		D503	8-719-802-02	DIODE TLY113AP (REW)	
L003	1-410-334-11	INDUCTOR 100UH		D504	8-719-802-02	DIODE TLY113AP (FF)	
L004	1-408-421-00	INDUCTOR 100UH		D505	8-719-940-XX	DIODE SLR-34VC3 (REC)	
L005	1-410-522-11	INDUCTOR 120UH		D506	8-719-940-82	DIODE SLR-34MC3 (PB)	
L006	1-410-511-21	INDUCTOR 15UH		D507	8-719-940-82	DIODE SLR-34MC3 (PB)	
L007	1-410-525-11	INDUCTOR 220UH		D509	8-719-955-04	DIODE PY5504S-1 (PAL)	
<u>TRANSISTOR</u>				D510	8-719-955-04	DIODE PY5504S-1 (SECAM)	
Q001	8-729-178-54	TRANSISTOR 2SC2785TP-F		D511	8-719-955-04	DIODE PY5504S-1 (NTSC 3.58)	
Q002	8-729-178-54	TRANSISTOR 2SC2785TP-F		D512	8-719-955-04	DIODE PY5504S-1 (NTSC 4.43)	
Q003	8-729-178-54	TRANSISTOR 2SC2785TP-F		<u>IC</u>			
Q004	8-729-900-80	TRANSISTOR DTC114ES		IC501	8-749-920-52	IC HC-107	
Q005	8-729-178-54	TRANSISTOR 2SC2785-F		<u>RESISTOR</u>			
Q051	8-729-178-54	TRANSISTOR 2SC2785-F		R501	1-249-417-11	CARBON 1K	5% 1/4W
<u>RESISTOR</u>				R502	1-249-420-11	CARBON 1.8K	5% 1/4W
R002	1-249-408-11	CARBON 180	5% 1/4W	R503	1-249-423-11	CARBON 3.3K	5% 1/4W
R003	1-247-814-11	CARBON 200	5% 1/4W	R504	1-249-429-11	CARBON 10K	5% 1/4W
R004	1-249-436-11	CARBON 39K	5% 1/4W	R505	1-249-417-11	CARBON 1K	5% 1/4W
R005	1-249-427-11	CARBON 6.8K	5% 1/4W	R506	1-249-420-11	CARBON 1.8K	5% 1/4W
R006	1-249-416-11	CARBON 820	5% 1/4W	R507	1-249-423-11	CARBON 3.3K	5% 1/4W
R007	1-249-416-11	CARBON 820	5% 1/4W				

When indicating parts by reference number, please include the board name.

Ref.No	Part No.	Description	Remark		
R508	1-249-429-11	CARBON	10K	5%	1/4W
R509	1-249-417-11	CARBON	1K	5%	1/4W
R510	1-249-420-11	CARBON	1.8K	5%	1/4W
R511	1-249-423-11	CARBON	3.3K	5%	1/4W
R512	1-249-429-11	CARBON	10K	5%	1/4W
R514	1-247-848-11	CARBON	5.1K	5%	1/4W
R515	1-249-429-11	CARBON	10K	5%	1/4W
R516	1-249-432-11	CARBON	18K	5%	1/4W
R517	1-247-854-11	CARBON	9.1K	5%	1/4W
R518	1-249-403-11	CARBON	68	5%	1/4W
R519	1-249-403-11	CARBON	68	5%	1/4W
R520	1-249-403-11	CARBON	68	5%	1/4W
R521	1-249-397-11	CARBON	22	5%	1/4W
R522	1-249-413-11	CARBON	470	5%	1/4W
R523	1-249-414-11	CARBON	560	5%	1/4W
<u>VARIABLE RESISTOR</u>					
RV501	1-237-979-11	RES, VAR, CARBON	10K	(SHARPNESS)	
RV502	1-237-980-11	RES, VAR, CARBON	100K	(TRACKING)	
<u>SWITCH</u>					
S501	1-553-856-00	SWITCH, KEY BOARD (PRESET TUNE)			
S502	1-553-856-00	SWITCH, KEY BOARD (FINE TUNE)			
S503	1-553-856-00	SWITCH, KEY BOARD (CLOCK)			
S504	1-553-856-00	SWITCH, KEY BOARD (TIMER SET/CHECK)			
S505	1-553-856-00	SWITCH, KEY BOARD (NEXT)			
S506	1-553-856-00	SWITCH, KEY BOARD (STOP ■)			
S507	1-553-856-00	SWITCH, KEY BOARD (FF ►►)			
S508	1-553-856-00	SWITCH, KEY BOARD (PLAY ►)			
S509	1-553-856-00	SWITCH, KEY BOARD (REC)			
S510	1-553-856-00	SWITCH, KEY BOARD (REC MODE β II/β III)			
S511	1-553-856-00	SWITCH, KEY BOARD (REW ◀◀)			
S512	1-553-856-00	SWITCH, KEY BOARD (PAUSE II)			
S513	1-553-856-00	SWITCH, KEY BOARD (CLEAR/RESET)			
S514	1-553-856-00	SWITCH, KEY BOARD (CHANNEL +)			
S515	1-553-856-00	SWITCH, KEY BOARD (TIMER REC)			
S517	1-553-856-00	SWITCH, KEY BOARD (CLOCK/COUNTER)			
S518	1-553-856-00	SWITCH, KEY BOARD (CHANNEL -)			
S519	1-570-338-11	SWITCH, SLIDE (NTSC)			
S520	1-570-338-21	SWITCH, SLIDE (COLOR)			
S521	1-570-338-11	SWITCH, SLIDE (EDIT)			
S522	1-570-338-31	SWITCH, SLIDE (SYSTEM SELECT)			

*1-628-162-11 FU-65 BOARD					

<u>CONNECTOR</u>					
CN502	1-565-776-11	CONNECTOR, BOARD TO BOARD 4P			
<u>DIODE</u>					
D501	8-719-940-82	DIODE SLR-34MC3			

Ref.No	Part No.	Description	Remark
R524	1-249-417-11	CARBON	1K 5% 1/4W
R525	1-249-413-11	CARBON	470 5% 1/4W
<u>SWITCH</u>			
S523	1-553-856-00	SWITCH, KEY BOARD (EJECT ▲)	
S524	1-553-856-00	SWITCH, KEY BOARD (ON/STANDBY)	

<u>MISCELLANEOUS</u>			

	X-2621-202-0	ROTOR ASSY, D	
	▲ 1-466-044-11	RF MODULATOR (RFU-2005)	
	▲ 1-551-908-71	CORD, POWER, EULO PLUG (2.5A 250V)	
	8-825-508-61	HEAD, FULL ERASE	
L901	1-464-781-11	SENSOR, COIL (S COIL SENSOR)	
L902	X-3716-014-1	SENSOR ASSY, T (T COIL SENSOR)	
M901	A-6050-492-A	DRUM ASSY (DSH-90A-R)	
M902	X-3696-314-1	MOTOR ASSY, L (LOADING MOTOR)	
M903	A-6706-852-A	UNIT BLOCK ASSY, L MOTOR (CAM MOTOR)	
M904	8-835-334-01	MOTOR, DC BHF-1917B (CAPSTAN MOTOR)	
S901	1-571-023-11	SWITCH, LEAF (2 GANG) (CASSETTE DOWN/REC PROOF)	
S902	1-571-024-11	SWITCH, ROTARY (ENCODER SW)	

<u>ACCESSORIES AND PACKING MATERIALS</u>			

Part No.	Description	Remark	
1-463-845-22	REMOTE COMMANDER		
1-506-401-00	ADAPTOR, CONVERSION		
1-551-513-00	CABLE, COAXIAL ASSY		
1-558-975-11	CORD, CONNECTION		
1-565-886-11	ADAPTOR, CONVERSION		
1-565-887-11	ADAPTOR, CONVERSION		
*3-677-503-00	SHEET, PROTECTION		
3-695-308-01	DRIVER, TUNING		
3-701-630-00	BAG, POLYETHYLENE		
*3-723-190-01	INDIVIDUAL CARTON (BLACK)		
*3-723-190-11	INDIVIDUAL CARTON (SILVER)		
*3-723-193-01	CUSHION (UPPER)		
*3-723-194-01	CUSHION (LOWER)		
3-786-305-41	MANUAL, INSTRUCTION		

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HARDWARE LIST

SET-SCREW

7-621-712-46 SET-SCREW, SLOT 2.6X5 FLAT POINT
7-683-174-21 SET-SCREW, SLOT 3X4 CONE POINT

STOP RING

7-624-101-01 STOP RING 1.2 (E TYPE)
7-624-105-04 STOP RING 2.3, TYPE -E

SCREW

7-627-552-58 SCREW, PRECISION +P 1.7X5
7-627-554-07 SCREW, PRECISION +P 2X2.2
7-628-254-00 SCREW +PS 2.6X5
7-682-645-01 SCREW +PS 3X4
7-682-647-09 SCREW +PS 3X6

7-685-645-79 SCREW +P 3X6 TYPE2 NON-SLIT
7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-79 SCREW +BVTP 3X8 TYPE2 IT-3
7-685-646-79 SCREW +BVTP 3X8 TYPE2
7-685-647-79 SCREW +BVTP 3X10 TYPE2 IT-3

7-685-647-79 SCREW +BVTP 3X10 TYPE2

SECTION 7 MECHANICAL ADJUSTMENTS

FOR MECHANICAL ADJUSTMENTS

Refer to mechanical adjustment manual for the adjustments and checks of mechanism section and the mechanical parts replacement.

SECTION 8 ELECTRICAL ADJUSTMENTS

During the adjustment, see the parts arrangement diagram relevant to the adjustment on page 130.

This section provides all necessary information and instructions for complete adjustment of the electronic circuits in this machine.

[Equipment required]

- 1) PAL color monitor TV
- 2) SECAM color monitor TV
- 3) NTSC color monitor TV
- 4) Oscilloscope Dual-trace, bandwidth more than
 15 MHz with delay mode
- 5) Frequency counter (more than four digits)
- 6) PAL color bar generator
- 7) SECAM color bar generator
- 8) NTSC color bar generator
- 9) Digital voltmeter (10 M Ω)
- 10) Audio generator
- 11) Audio level meter
- 12) Distortion meter
- 13) Attenuator
- 14) PAL alignment tape Type : KR5-2H
 Code No. 8-969-995-52
- 15) SECAM alignment tape Type : KR5-1J
 Code No. 8-969-996-03
- 16) NTSC alignment tape Type : KR5-1V
 Code No. 8-969-995-92

[Setup for adjustment]

The antenna should be connected correctly to the antenna input terminal of the videocassette recorder. It is important that the video output signal satisfies the specification because the telecast signal received by the incorporated tuner of the videocassette recorder is utilized as the adjustment signal of the machine. The incorporated tuner should be set to the channel with the best reception. The video signal should be checked with an oscilloscope connected to VIDEO OUT (CNJ002 on VI-50 board). Verify that

the SYNC signal amplitude is approx. 0.3 Vp-p and the video signal amplitude is approx. 0.7 Vp-p at peak. Adjust the fine tuning while observing the signal and the TV screen so that the burst signal amplitude becomes approx. $0.3V \pm 0.1$ Vp-p. Also confirm that there is not spikes observed at the SYNC signal portion. (See Fig. 8-1.)

The video (color bar) signal for the adjustment is shown in Fig. 8-1.

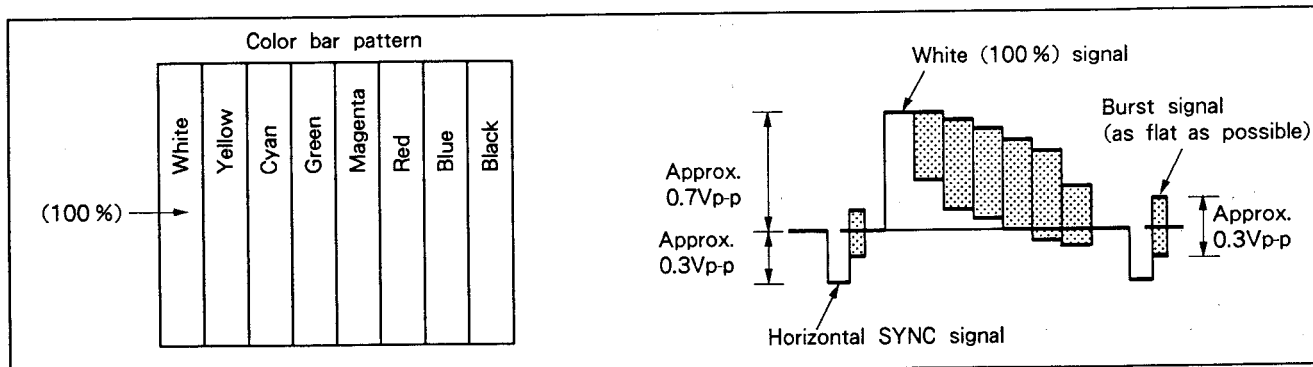


Fig. 8-1 (a). PAL video (color bar) signal

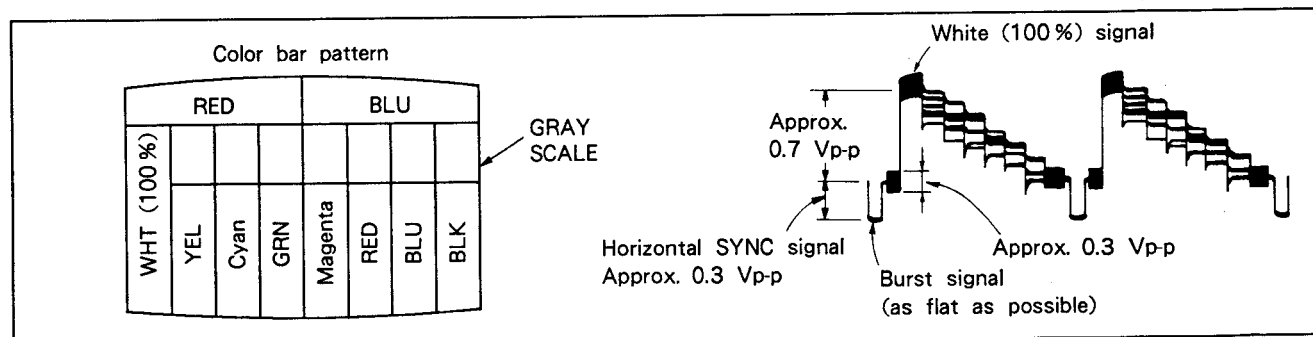


Fig. 8-1 (b). SECAM video (color bar) signal

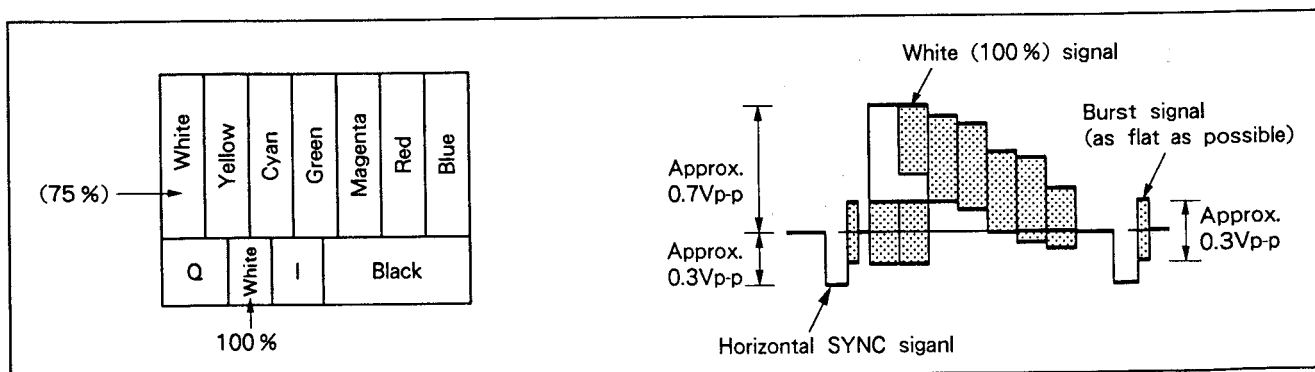


Fig. 8-1 (c). NTSC video (color bar) signal

[Alignment tape]

KR5-2H (PAL), KR5-1J (SECAM)

	Video signal	Audio signal	Playing time	Use for
1	Color bars	3 kHz, - 10 dB	5 min	General performance, tape speed checks, switching position adjustment.
2	Monoscope	333 Hz, - 30 dB	5 min	Video head dihedral, audio level adjustment.
3	RF sweep	5 kHz, - 30 dB	5 min	Video, audio frequency characteristics, audio azimuth adjustment marker : 1 MHz, 2 MHz, 3.58 MHz, 4.5 MHz, 5.2 MHz.
4	Tracking 1 MHz (CH-A) * 1 (Channel B is inserted in every 3 frames.)	1 kHz, - 10 dB * 2 (Signal is dropped out in the positions where channel B is inserted.)	5 min	Tracking, Audio height adjustments CTL Position check (Check if * 1 and * 2 are the same position.)

KR5-1V (NTSC)

Tape speed	Video signal	Audio signal	Playing time
20.0 mm/sec. (β II)	Color bars	3 kHz, - 10 dB	4 min. for each segment
	Monoscope	333 Hz, - 30 dB	
	RF sweep	5 kHz, - 30 dB	
	Tracking	1 kHz, - 10 dB	
	Color bars	Beta hifi 400 Hz $\pm$ 25 kHz DEV	
13.3 mm/sec. (β III)	Monoscope	5 kHz, - 30 dB	
	Color bars	3 kHz, - 10 dB	

[Color bar signals]

PAL (KR5-2H)

The 100% color bar signal recorded on the alignment tape is shown in Fig. 8-2 (a).

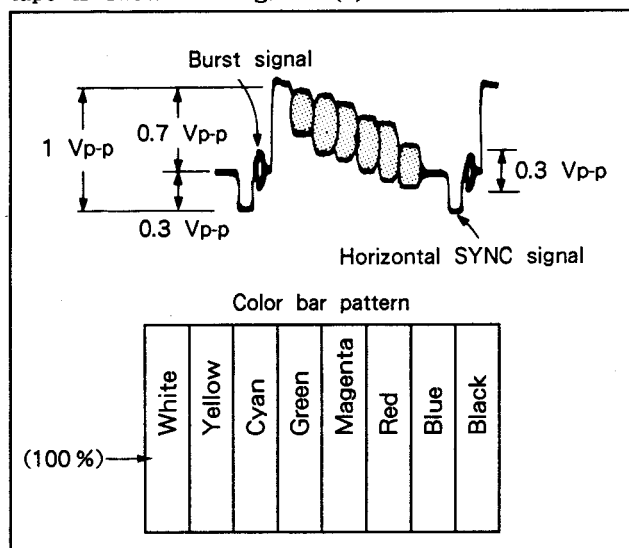


Fig. 8-2 (a). Color bar signal recorded on the alignment tape

SECAM (KR5-1J)

The 100% color bar signal recorded on the alignment tape is shown in Fig. 8-2 (b).

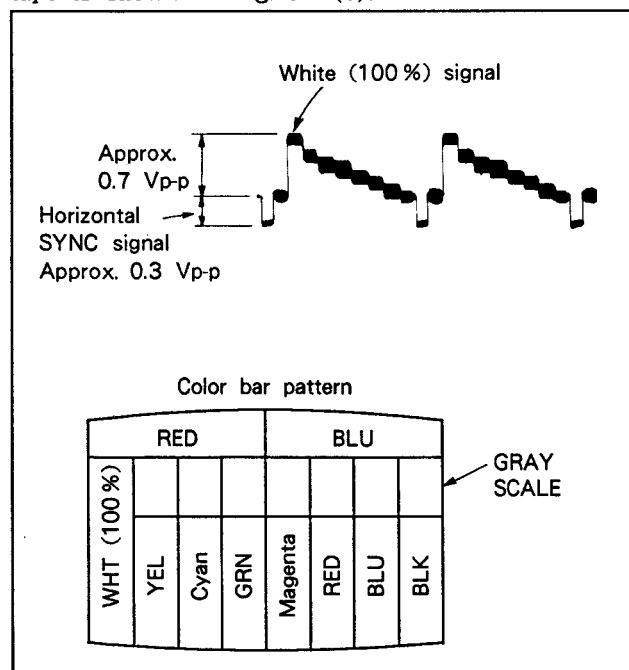


Fig. 8-2 (b). Color bar signal recorded on the alignment tape

NTSC (KR5-1V)

The 75% color bar signal recorded on the alignment tape is shown in Fig. 8-2 (c).

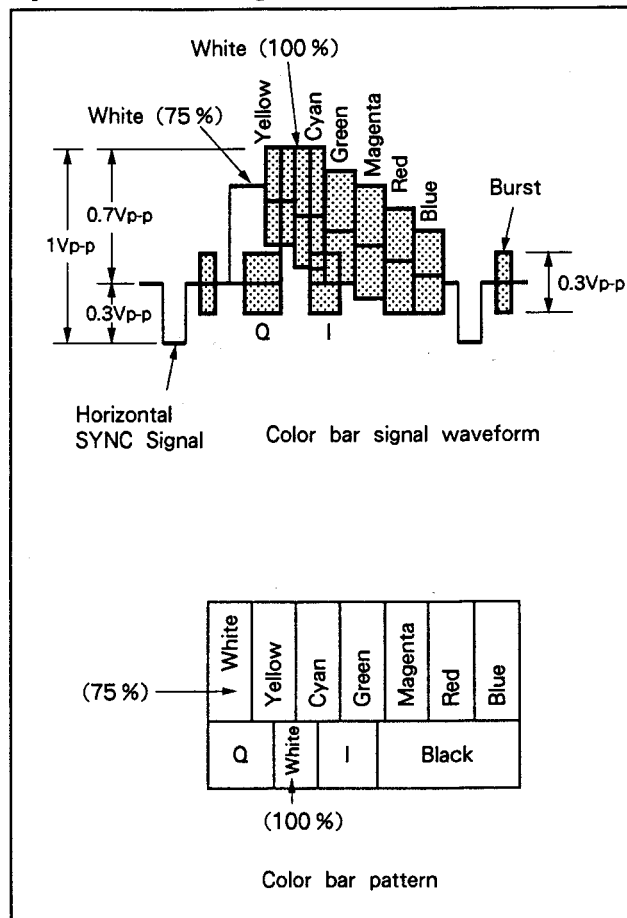


Fig. 8-2 (c). 75% color bar signal recorded on the alignment tape

[Required levels and impedances of input and output]

Video

Input VIDEO IN : phono jack
1 V_{p-p}
75 Ω unbalanced, SYNC
negative

VIDEO OUT : phono jack
1 V_{p-p}
75 Ω unbalance, SYNC
negative

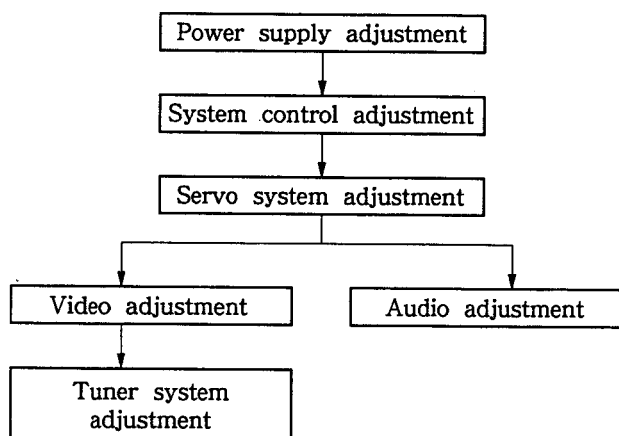
Audio

Input AUDIO IN : phono jack
47 kΩ, -10 dBs
(0 dBs = 0.775 V_{rms})

Output AUDIO OUT : phono jack
Load impedance less than
10 kΩ
-10 dBs with 47 kΩ load
unbalanced

[Adjustment procedure]

Adjust in the order given below.



8-1. POWER SUPPLY SECTION ADJUSTMENT (PS-187 BOARD)

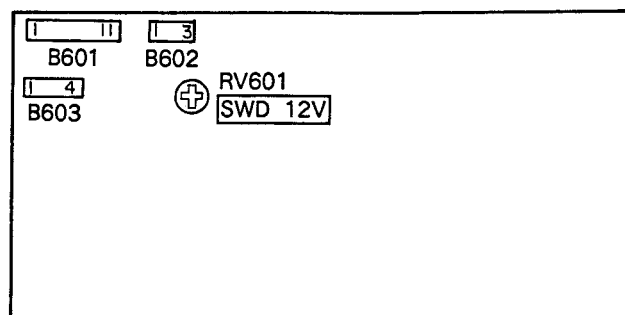


Fig. 8-3. Component layout (component side)

8-1-1. SWD 12V Adjustment (PS-187 Board)

Mode	E-E
Measurement Point	Pin ③ of B601
Measuring Instrument	Digital voltmeter
Adjusting Element	RV601
Specified Value	12.0 ± 0.3 Vdc

Adjusting method :

- 1) Adjust with RV601 so that it becomes 12.0 ± 0.3 Vdc.

8-1-2. Power Voltage Checking (PS-187 Board)

Mode	E-E
Measuring Instrument	Digital voltmeter
Checking of SWD 9V	
Measurement Point	Pin ① of B601
Specified Value	9.0 ± 0.2 Vdc
Checking of UN 42V	
Measurement Point	Pin ⑤ of B601
Specified Value	42 ± 3 Vdc
Checking of UN 5.6V	
Measurement Point	Pin ⑥ of B601
Specified Value	5.6 ± 0.5 Vdc
Checking of UN -45V	
Measurement Point	Pin ⑦ of B601
Specified Value	-45 ± 3 Vdc
Checking of UN 3.2V	
Measurement Point	Pins ⑩ and ⑪ of B601
Specified Value	3.2 ± 0.5 Vdc

Confirmation method :

- 1) Be sure that the voltage of the respective measurement points satisfy the specified values.

8-2. SYSTEM CONTROL ADJUSTMENT (SA-28 BOARD)

8-2-1. Clock Adjustment

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ⑥ of IC005
Measuring Instrument	Frequency counter
Adjusting Element	CV001
Specified Value	2097152 ± 50 Hz

Connection :

- 1) Connect the following two locations using jumper wires.
 1. Pin ⑤ of IC005 — GND
 2. Pin ⑥ of IC005 — GND

Adjustment method :

- 1) Connect the Pin ③ of IC006 to GND using a jumper wire temporarily. (Be sure to remove it momentarily)
- 2) Adjust to 2097152 ± 50 Hz with CV001.

8-3. SERVO SYSTEM ADJUSTMENT

Note : When adjusting PAL/SECAM, input the PAL/SECAM video signal and set SYSTEM SELECT SW to PAL/SECAM. When adjusting NTSC, input NTSC video signal and set SYSTEM SELECT SW to NTSC 3.58.

[Adjusting order]

1. Voltage check
2. Clock check
3. Drum DC bias adjustment
4. Capstan DC bias adjustment
5. Tracking center adjustment
6. RF switching position adjustment
7. Drum lock phase adjustment
8. Picture search FH adjustment

8-3-1. Drum/Capstan Servo System Adjustment

1. Voltage check (SA-28 board)

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ⑩ of IC301
Measuring Instrument	Digital voltmeter
Specified Value	5.00 ± 0.25 Vdc

Confirmation method :

- 1) Be sure that the voltage of Pin ⑩ of IC301 is 5.00 ± 0.25 Vdc.

2. Clock check (SA-28 board)

Mode	E-E
Signal	Non-signal
Measurement Point	Pin ② of IC301
Measuring Instrument	Oscilloscope
Specified Value	More than 100 mVp-p

Confirmation method :

- 1) Confirm that 4.43 MHz clock signal level is more than 100 mVp-p.

3. Drum DC bias adjustment (SA-28 board)

(1) NTSC drum DC bias adjustment

Mode	Playback
Signal	Alignment tape (KR5-1V) (β II color bar)
Measurement Point	Pin ④ of IC301 (Pin ② of CN307)
Measuring Instrument	Digital voltmeter
Adjusting Element	RV301
Specified Value	1.8 ± 0.1 Vdc

Adjusting method :

- 1) Adjust with RV301 so that it becomes 1.8 ± 0.1 Vdc.
- 2) Perform "PAL / SECAM drum DC bias adjustment".

(2) PAL/SECAM drum DC bias adjustment

Mode	Playback or recording
Signal	PAL or SECAM color bar
Measurement Point	Pin ④ of IC301 (Pin ② of CN307)
Measuring Instrument	Digital voltmeter
Adjusting Element	RV305
Specified Value	1.8 ± 0.1 Vdc

Adjusting method :

- 1) Adjust with RV305 so that it becomes 1.8 ± 0.1 Vdc.

4. Capstan DC bias adjustment (SA-28 board)

(1) NTSC capstan DC bias adjustment

Mode	Playback
Signal	Alignment tape (KR5-1V) β II color bar
Measurement Point	Pin ⑦ of IC301 (Pin ④ of CN307)
Measuring Instrument	Digital voltmeter
Adjusting Element	R307
Specified Value	1.8 ± 0.2 Vdc

Adjusting method :

- 1) Adjust with RV307 so that it becomes 1.8 ± 0.2 Vdc.
- 2) Perform "PAL / SECAM capstan DC bias adjustment".

(2) PAL/SECAM capstan DC bias adjustment

Mode	Playback or recording
Signal	PAL or SECAM color bar
Measurement Point	Pin ⑦ of IC301 (Pin ④ of CN307)
Measuring Instrument	Digital voltmeter
Adjusting Element	RV312
Specified Value	1.8 ± 0.2 Vdc

Adjusting method :

- 1) Adjust with RV312 so that it becomes 1.8 ± 0.2 Vdc.

5. Tracking center adjustment (SA-28 board)

(1) NTSC tracking center adjustment

Mode	Recording (β II)
Signal	NTSC color bar
Measurement Point	CH1 : Pin ④ of IC301 (Pin ③ of CN307 : REC CTL) CH2 : Pin ④ of IC301 (Pin ⑤ of CN307 : CP RAMP) CH2 : Pin ③ of IC301 (Pin ⑥ of CN307 : TRACON)
Measuring Instrument	Oscilloscope
Adjusting Element	RV306
Specified Value	$ T_1 - T_2 \leq 100 \mu\text{sec}$

Adjusting method :

- 1) Set tracking control to the center click position.

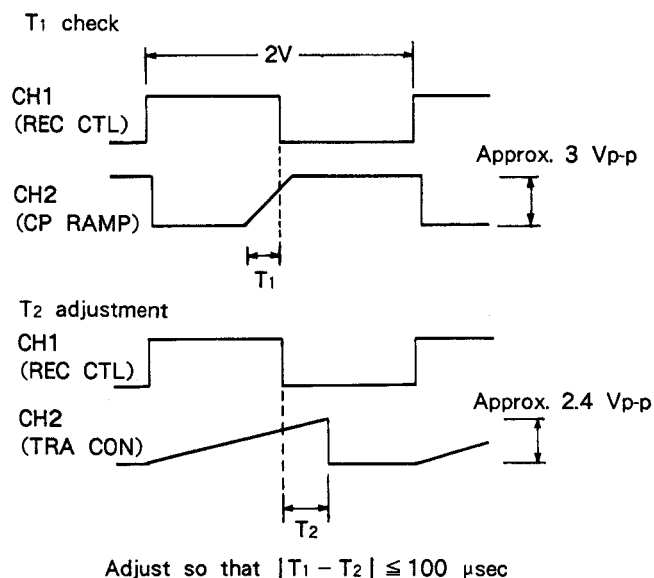


Fig. 8-4. NTSC tracking center adjustment

- 2) Connect the oscilloscope (CH2) to Pin ⑤ of CN307.
- 3) Read the phase difference T₁ between CH1 and CH2.
- 4) Connect the oscilloscope (CH2) to Pin ⑥ of CN307.
- 5) Set RV306 so that the phase difference between CH1 and CH2 is $|T_1 - T_2| \leq 100 \mu\text{sec}$.
- 6) Perform "PAL / SECAM tracking center adjustment".

(2) PAL/SECAM tracking center adjustment

Mode	Recording
Signal	PAL or SECAM color bar
Measurement Point	CH1 : Pin ④ of IC301 (Pin ③ of CN307) CH2 : Pin ③ of IC301 (Pin ⑥ of CN307)
Measuring Instrument	Oscilloscope
Adjusting Element	RV309
Specified Value	$3.2 \pm 0.1 \text{ msec}$

Adjusting method :

- 1) Position the tracking knob to center click.
- 2) Adjust to $3.2 \pm 0.1 \text{ msec}$ with RV309.

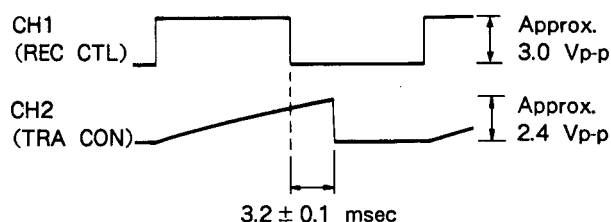


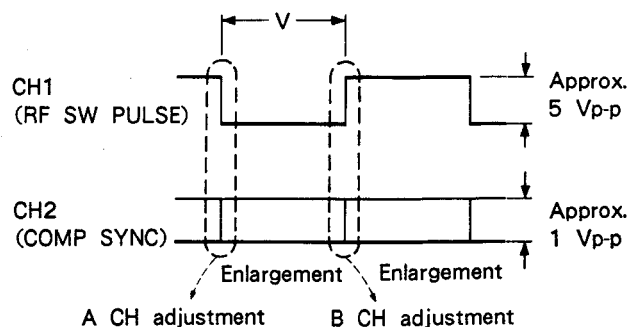
Fig. 8-5. PAL/SECAM tracking center adjustment

6. RF switching position adjustment (SA-28 board)

Mode	Playback
Signal	Alignment tape NTSC (KR5-1V) PAL or SECAM (KR5-2H or KR5-1J)
Measurement Point	CH1 : Pin ④ of IC301 (Pin ① of CN307) CH2 : Pin ⑬ of CN010
Measuring Instrument	Oscilloscope
Adjusting Element	NTSC RV304 (A ch) RV303 (B ch) PAL or SECAM RV311 (A ch) RV310 (B ch)
Specified Value	$7 \pm 0.5H$ ($448 \pm 30 \mu\text{sec}$)

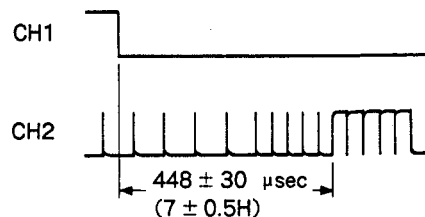
Adjusting method :

- 1) Playback the NTSC alignment tape (KR5-1V).
- 2) Turn the TRACKING knob and set for the optimum state while observing the monitor TV screen.
- 3) Adjust RV304 so that the lock phase of RF SW PULSE (A ch) is $7 \pm 0.5H$ ($448 \pm 30 \mu\text{sec}$).
- 4) Adjust RV303 so that the lock phase of RF SW PULSE (B ch) is $7 \pm 0.5H$ ($448 \pm 30 \mu\text{sec}$).
- 5) Playback the PAL or SECAM alignment tape (KR5-2H or KR5-1J).
- 6) Turn the TRACKING knob and set for the optimum state while observing the monitor TV screen.
- 7) Adjust RV311 so that the lock phase of RF SW PULSE (A ch) is $7 \pm 0.5H$ ($448 \pm 30 \mu\text{sec}$).
- 8) Adjust RV310 so that the lock phase of RF SW PULSE (B ch) is $7 \pm 0.5H$ ($448 \pm 30 \mu\text{sec}$).



A CH adjustment

(NTSC : RV304
PAL/SECAM : RV311)



B CH adjustment

(NTSC : RV303
PAL/SECAM : RV310)

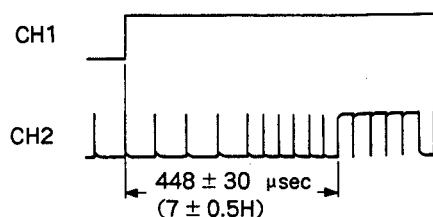


Fig. 8-6. RF switching position adjustment

7. Drum lock phase adjustment (SA-28 board)

Mode	Recording
Signal	PAL or SECAM color bar
Measurement Point	CH1 : Pin ④ of IC301 (Pin ① of CN307) CH2 : Pin ④ of IC301 (Pin ③ of CN307)
Measuring Instrument	Oscilloscope
Adjusting Element	RV302
Specified Value	$445 \pm 30 \mu\text{sec}$

Adjusting method :

- 1) Adjust with RV302 so that the lock phases of CH1 (RF SW PULSE) and CH2 (REC CTL) both become $445 \pm 30 \mu\text{sec}$.

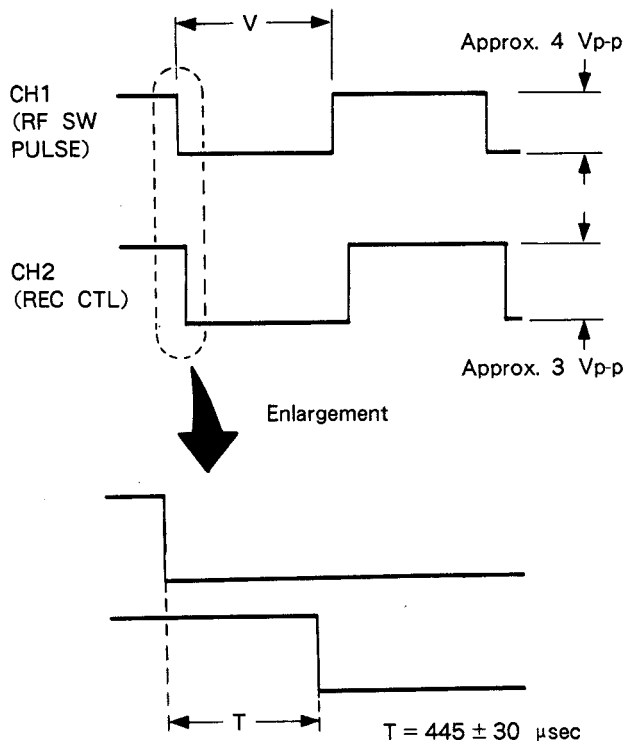


Fig. 8-7. Drum lock phase adjustment

8. Picture search fh adjustment (SA-28 board)

Mode	FWD picture search (CUE)
Signal	PAL or SECAM alignment tape (KR5-2H or KR5-1J) color bar or monoscope
Measurement Point	Pin ⑩ of CN010 (COMP SYNC)
Measuring Instrument	Oscilloscope
Adjusting Element	RV308
Specified Value	Deviation during picture search is $0 \pm 0.2 \mu\text{sec}$

Adjusting method :

- 1) Adjust with RV308 so that the fh cycle during picture search (CUE) against the fh cycle during playback becomes within $0 \pm 0.2 \mu\text{sec}$.
- 2) Be sure that the picture search is within the deviation also with REV.

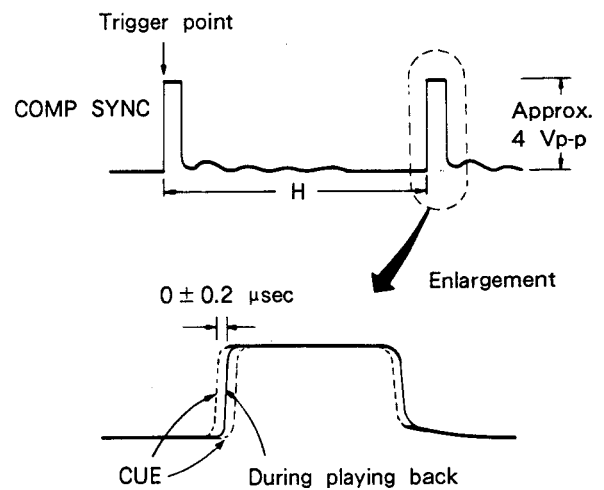


Fig. 8-8. Picture search fh adjustment

8.4. VIDEO SYSTEM ADJUSTMENT

As a rule, first, adjust the Y signal system and check that it operates normally, then adjust the chroma signal system.

The adjusting order is shown below. The Y signal and chroma signal systems are adjusted for both playback and recording systems.

Color video signals supplied by the PAL color bar generator and the SECAM color bar generator and NTSC color bar generator are used as video input signal for video system adjustment in the record mode. Check that the SYNC and color burst signals conform to the specifications designated in "Set-up for adjustment" in Fig. 8-1.

Note : Unless otherwise specified, set the following switch.

- INPUT SELECT switch PAL/SECAM

[Adjusting Order]

8-4-1. Y Signal System Adjustment

1. Playback frequency characteristic adjustment
2. Y-comb adjustment
3. NTSC de-emphasis level adjustment
4. Playback video level adjustment
5. SYNC AGC adjustment
6. SYNC tip carrier set and deviation adjustment
7. PAL/SECAM white clip adjustment and dark clip check
8. Y record current adjustment

8-4-2. Chroma Signal System Adjustment

1. VXO adjustment
2. AFC adjustment
3. AFC offset adjustment
4. Pilot burst signal level adjustment
5. Chroma record current adjustment
6. Chroma comb filter adjustment
7. Carrier balance adjustment
8. JOG PLL adjustment
9. Shift adjustment
10. JOG exchange chroma level adjustment

8-4-3. SECAM Chroma Signal System Adjustment

1. Bell filter adjustment
2. Counter bell filter adjustment

8-4-4. JOG System Adjustment

1. PAL/SECAM JOG adjustment
2. NTSC JOG AFC adjustment

8-4-1. Playback System Adjustment

1. Playback frequency characteristics adjustment (RP-70 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) RF sweep
Measurement Point	Pin ③ of CN002 External trigger : Pin ① of CN002
Measuring Instrument	Oscilloscope
Adjusting Element	RV001
Specified Value	When 2 MHz level is made 100%, the 5.1 MHz level is 56 to 62%

Adjusting method :

- 1) Turn tracking knob to maximum output.
- 2) Set the trigger slope to -.
- 3) Adjust the 5.2 MHz amplitude to 56 to 62 % of the 2 MHz amplitude with RV001.

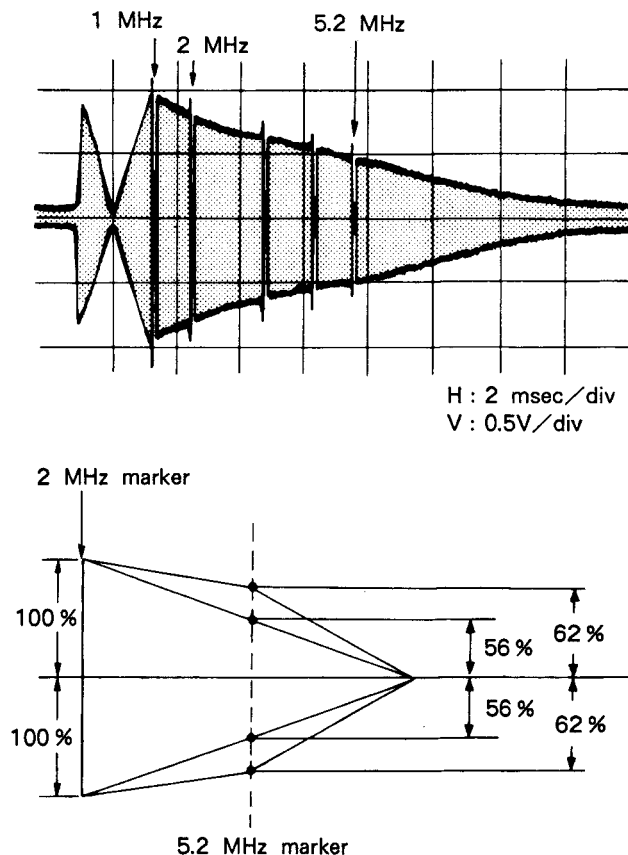


Fig. 8-9. Playback amplifier frequency characteristic adjustment

2. Y-comb adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Pin ⑧ of IC002
Measuring Instrument	Oscilloscope
Adjusting Element	RV009
Specified Value	See Fig. 8-10. A level $\approx$ B level

Adjusting method :

- 1) Rotate RV009 to adjust to that the limiter works vertically symmetrically (See Fig. 8-10).

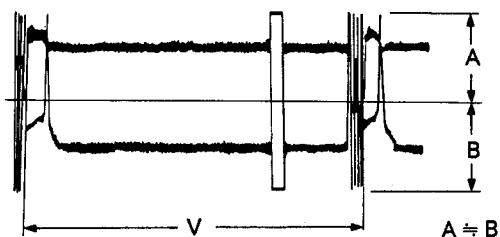


Fig. 8-10.

3. NTSC de-emphasis level adjustment (VI-50 board)

Mode	Playback
Signal	Alignment tape (KR5-1V) β II color bar portion (Note)
Measurement Point	Pin ④ of IC402
Measuring Instrument	Oscilloscope
Adjusting Element	RV407
Specified Value	1.30 ± 0.05 Vp-p

Note : Set the INPUT SELECT switch to NTSC 3.58.

Adjusting method :

- 1) Adjust to 1.30 ± 0.05 Vp-p with RV407.

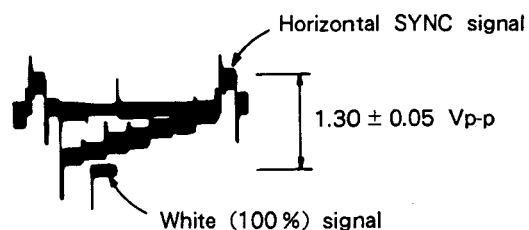


Fig. 8-11.

4. Playback video level adjustment (VI-50 board)

(1) NTSC playback video level adjustment

Mode	Playback
Signal	Alignment tape (KR5-1V) β II color bar portion (Note1))
Measurement Point	CNJ002 (VIDEO OUT) (Note : 2))
Measuring Instrument	Oscilloscope
Adjusting Element	RV406
Specified Value	1.00 ± 0.05 Vp-p

Note : 1) Set the INPUT SELECT switch to NTSC 3.58.
2) Video output terminal is terminated by 75Ω .

Adjusting method :

- 1) Adjust to 1.00 ± 0.05 Vp-p with RV406.
- 2) Perform "PAL/SECAM playback video level adjustment".

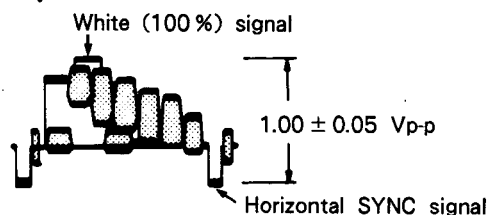


Fig. 8-12. NTSC playback video level adjustment

(2) PAL/SECAM playback video level adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	CNJ002 (VIDEO OUT) (Note)
Measuring Instrument	Oscilloscope
Adjusting Element	RV404
Specified Value	1.00 ± 0.05 Vp-p

Note : The VIDEO OUT terminal should be terminated at 75Ω .

Adjusting method :

- 1) Adjust to 1.00 ± 0.05 Vp-p with RV003.

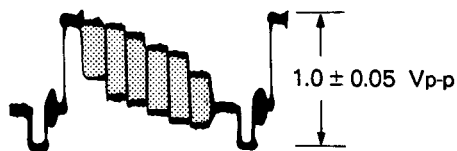


Fig. 8-13. PAL/SECAM playback video level adjustment

5. SYNC AGC adjustment (VI-50 board)

Mode	Recording or E-E
Signal	PAL color bar
Measurement Point	CNJ002 (VIDEO OUT) (Note)
Measuring Instrument	Oscilloscope
Adjusting Element	RV001
Specified Value	1.00 ± 0.05 Vp-p

Note : The VIDEO OUT terminal should be terminated at 75Ω .

Adjusting method :

- 1) Adjust with RV001 so that it becomes 1.00 ± 0.05 Vp-p.

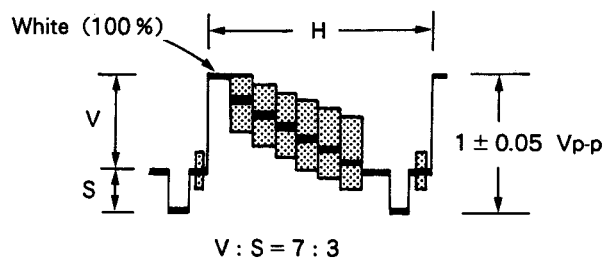


Fig. 8-14. SYNC AGC adjustment

6. SYNC chip carrier set and deviation adjustment

(1) PAL/SECAM SYNC chip carrier set and deviation adjustment (VI-50 board)

SYNC chip carrier set adjustment	
Mode	E-E
Signal	Non-signal (Note : 1))
Measurement Point	Pin ⑤ of IC001
Measuring Instrument	Frequency counter
Adjusting Element	RV403
Specified Value	3.8 ± 0.05 MHz
Deviation adjustment	
Mode	Recording and playback
Signal	PAL color bar
Measurement Point	CNJ002 (VIDEO OUT) (Note : 2))
Measuring Instrument	Oscilloscope
Adjusting Element	RV405
Specified Value	Playback level is 1.00 ± 0.05 Vp-p

Note : 1) Install a shorting plug to the VIDEO IN jack.

2) The VIDEO OUT terminal should be terminated at 75Ω .

Adjusting method :

- 1) Set to E-E mode by inputting PAL color bar signal.
- 2) Connect an oscilloscope to Pin ⑨ of IC401 and check the Y signal level.

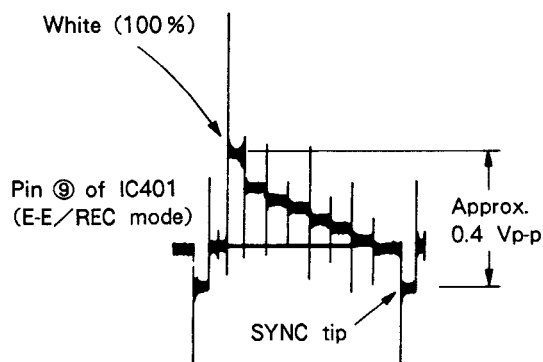


Fig. 8-15. PAL/SECAM deviation adjustment (1)

See Fig. 8-15. This signal level and the playback Y signal level, which will be described later, become proportionate (proportional to the deviation). The criterion of this deviation adjustment (RV405) is to make this Y signal level to 0.4 Vp-p .

- 3) As a non-signal input (Note: 1)), set to E-E mode.
- 4) Connect the frequency counter to Pin ⑤ of IC001 and adjust with RV403 so that it becomes 3.8 ± 0.05 MHz. (SYNC chip carrier set adjustment)
- 5) Input PAL color bar signal and record it.
- 6) Play back the recorded section and check the playback Y signal level of CNJ002.
Specification : Be sure to it is $1.00 \pm 0.05 \text{ Vp-p}$.

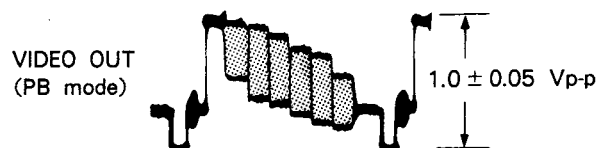


Fig. 8-16. PAL/SECAM deviation adjustment (2)

- 7) In the event it is out of specification, input the color bar signal and set to the E-E mode. Then adjust with RV405 so as to correct the level difference of the playback Y signal while observing the Y signal level of Pin ⑨ of IC401 and thereafter repeat items 3) to 6).

(2) NTSC SYNC chip carrier set and deviation adjustment (VI-50 board)

SYNC chip carrier set adjustment	
Mode	E-E
Signal	Non-signal (Note : 1), 2))
Measurement Point	Pin ⑤ of IC001
Measuring Instrument	Frequency counter
Adjusting Element	RV409
Specified Value	4.40 ± 0.05 MHz
Deviation adjustment	
Mode	Recording and playback
Signal	NTSC color bar
Measurement Point	CNJ002 (VIDEO OUT) (Note : 3))
Measuring Instrument	Oscilloscope
Adjusting Element	RV408
Specified Value	Playback level is 1.00 ± 0.05 Vp-p

Note : 1) Install a shorting plug to the VIDEO IN jack.
 2) Set the input select SW to NTSC 3.58.
 3) The VIDEO OUT terminal should be terminated at 75Ω .

Adjusting method :

- 1) Set to E-E mode by inputting NTSC color bar signal.
- 2) Connect an oscilloscope to Pin ⑰ of IC402 and check the Y signal level.

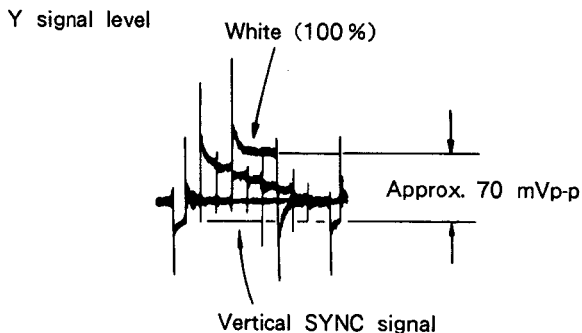


Fig. 8-17. NTSC deviation adjustment (1)

See Fig. 8-17. This signal level and the playback Y signal level, which will be described later, become proportionate (proportional to the deviation). The criterion of this deviation adjustment (RV408) is to make this Y signal level to 0.4 Vp-p.

- 3) As a non-signal input (Note:1)), set to E-E mode.
- 4) Connect the frequency counter to Pin ⑤ of IC001 and adjust with RV409 so that it becomes 4.40 ± 0.05 MHz. (SYNC chip carrier set adjustment)
- 5) Input NTSC color bar signal and record it.
- 6) Play back the recorded section and check the playback Y signal level of CNJ002.
 Specification : Be sure to it is 1.00 ± 0.05 Vp-p.

Playback Y signal level

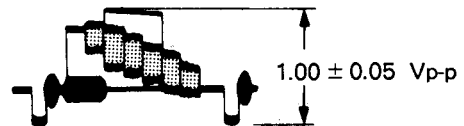


Fig. 8-18. NTSC deviation adjustment (2)

- 7) In the event it is out of specification, input the color bar signal and set to the E-E mode. Then adjust with RV408 so as to correct the level difference of the playback Y signal while observing the Y signal level of Pin ⑰ of IC402 and thereafter repeat items 3) to 6).

7. PAL/SECAM white clip and dark clip adjustment (VI-50 board)

Mode	E-E
Signal	PAL color bar
Measurement Point	Pin ⑨ of IC401
Measuring Instrument	Oscilloscope
Adjusting Element	RV401 (white clip) RV402 (dark clip)
Specified Value	200 ± 10 % (white clip) 70 ± 10 % (dark clip)

Adjusting method :

- 1) Adjust RV401 so that the signal tip (white peak) is 200 ± 10 %.
- 2) Adjust RV402 so that the signal tip (dark peak) is 70 ± 10 %.

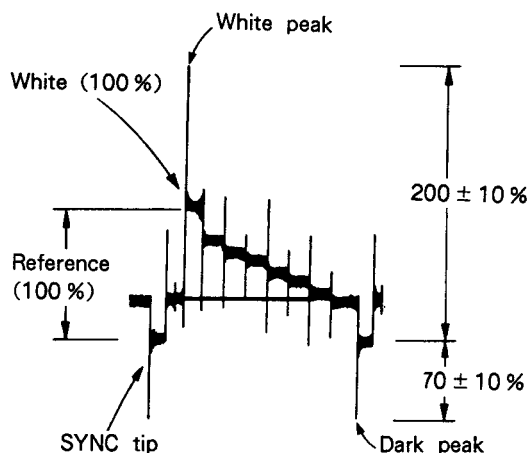


Fig. 8-19. Dark clip and white clip adjustment

8. Y record current adjustment (VI-50 board)

Mode	Recording
Signal	None (Install a shorting plug to VIDEO IN jack.)
Measurement Point	Center terminal of RV002 (Pin ② of CN003)
Measuring Instrument	Oscilloscope
Adjusting Element	RV002
Specified Value	290 ± 10 mVp-p

Adjusting method :

- 1) Adjust to 290 ± 10 mVp-p with RV002.

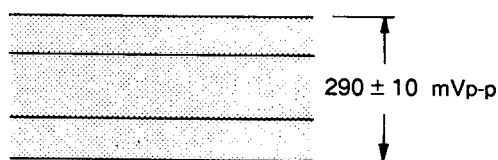


Fig. 8-20. Y record current adjustment

8-4-2. Chroma Signal System Adjustment

1. VXO adjustment

(1) PAL/SECAM 4.43 MHz VXO adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Pin ⑧ of CN001
Measuring Instrument	Frequency counter
Adjusting Element	RV017
Specified Value	4.433619 MHz ± 5 Hz

Adjusting method :

- 1) Adjust to 4.433619 MHz ± 5 Hz with RV017.
- 2) Perform "NTSC 3.58 MHz VXO adjustment".

(2) NTSC 3.58 MHz VXO adjustment (SA-28 board)

Mode	Playback
Signal	NTSC alignment tape (KR5-1V) β II or β III color bar portion (Note)
Measurement Point	Pin ⑧ of CN001
Measuring Instrument	Frequency counter
Adjusting Element	RV026
Specified Value	3579545 ± 25 Hz

Note : Set the INPUT SELECT switch to NTSC 3.58.

Adjusting method :

- 1) Adjust to 3579545 ± 25 Hz with RV026.

2. AFC adjustment (VI-50 board)

Mode	E-E
Signal	PAL color bar
Measurement Point	Pin ② of IC004
Measuring Instrument	Oscilloscope
Adjusting Element	RV018
Specified Value	$4.50 \pm 0.01 \text{Vdc}$

Adjusting method :

- 1) Adjust to $4.50 \pm 0.01 \text{Vdc}$ with RV018.
- 2) Play back the color bar portion of the alignment tape, and check that the color on the PAL monitor TV for correct quality.

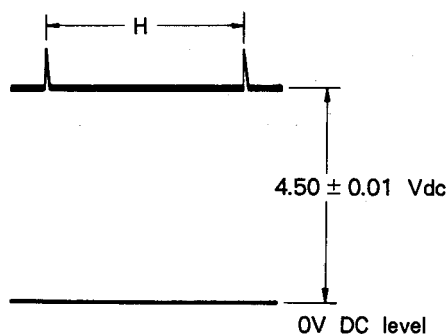


Fig. 8-21. AFC adjustment

3. AFC offset adjustment (VI-50 board)

Mode	Recording
Signal	PAL color bar
Measurement Point	Pin ② of IC004
Measuring Instrument	Oscilloscope
Adjusting Element	RV019
Specified Value	Minimum fluctuation of DC level.

Adjusting method :

- 1) Adjust RV019 so that the fluctuation of DC level is minimum.

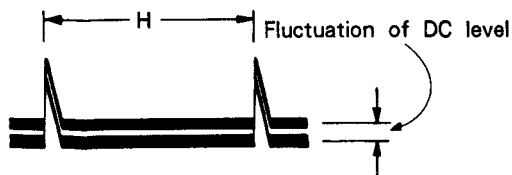


Fig. 8-22. AFC offset adjustment

4. Pilot burst signal level adjustment (VI-50 board)

Mode	E-E
Signal	PAL color bar
Measurement Point	Pin ① of IC004
Measuring Instrument	Oscilloscope
Adjusting Element	RV016
Specified Value	The pilot burst level is $100 \pm 5\%$ against the chroma level.

Adjusting method :

- 1) Adjust the pilot burst signal with the chroma signal level using RV016.

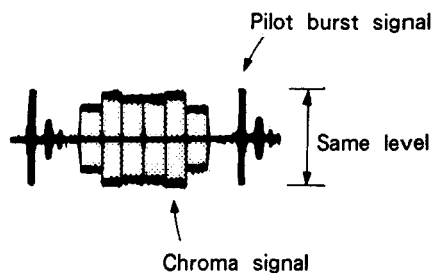


Fig. 8-23. Pilot burst signal level adjustment

5. Chroma record current adjustment (VI-50 board)

Mode	E-E
Signal	PAL color bar
Measurement Point	Base of Q053
Measuring Instrument	Oscilloscope
Adjusting Element	RV015
Specified Value	$90 \pm 5 \text{ mVp-p}$

Adjusting method :

- 1) Adjust to $90 \pm 5 \text{ mVp-p}$ with RV015.

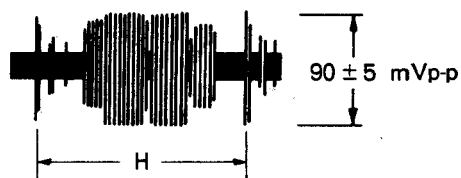


Fig. 8-24. Chroma record current adjustment

6. Chroma comb filter adjustment

(1) NTSC 4.43 comb filter adjustment (VC-52 board)

Mode	Playback
Signal	NTSC alignment tape (KR5-1V) β II color bar (Note)
Measurement Point	CNJ002 (VIDEO OUT)
Measuring Instrument	Oscilloscope
Adjusting Element	RV802, LV803
Specified Value	Minimum crosstalk

Note : Set the INPUT SELECT switch to NTSC 4.43.

Adjusting method :

- 1) Minimize the crosstalk component by alternately adjusting RV802 and LV803.
- 2) Make PAL comb filter adjustment.

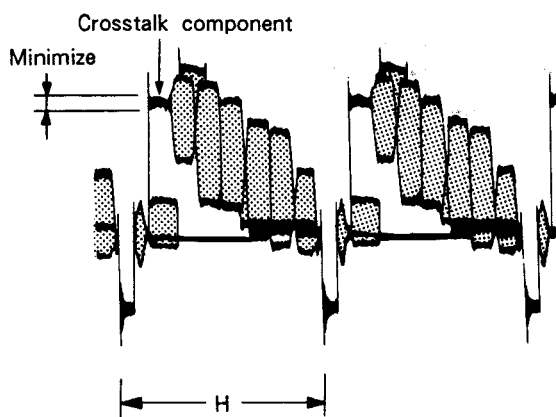


Fig. 8-25. NTSC comb filter adjustment

(3) NTSC 3.58 comb filter adjustment (VC-52 board)

Mode	Recording or E-E
Signal	NTSC color bar (Note)
Measurement Point	Pin ⑥ of CN802
Measuring Instrument	Oscilloscope
Adjusting Element	RV801 and LV802

Note : Set the INPUT SELECT switch to NTSC 3.58.

Adjusting method :

- 1) Adjust RV801 and LV802 alternately to minimize the residual chroma component.

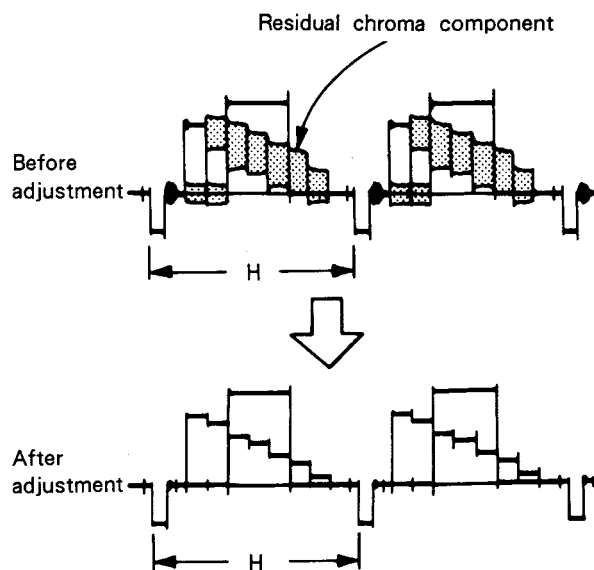


Fig. 8-26. NTSC 3.58 comb filter adjustment

(2) PAL comb filter adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Adjust while observing the PAL monitor TV screen.
Measuring Instrument	
Adjusting Element	RV803, LV805
Specified Value	Minimum beats.

Adjusting method :

- 1) Minimize beats with RV803 and LV805.

7. Carrier balance adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Adjust while observing the
Measuring Instrument	PAL monitor TV screen.
Adjusting Element	RV020
Specified Value	Minimum beats.

Adjusting method :

- 1) Minimize beats with RV020.

8. JOG PLL adjustment (VI-50 board)

Mode	E-E
Signal	PAL color bar
Measurement Point	Pin ⑩ of IC007
Measuring Instrument	Oscilloscope
Adjusting Element	RV022
Specified Value	$20 \pm 0.5 \mu\text{sec}$

Adjusting method :

- 1) Adjust to $20 \pm 0.5 \mu\text{sec}$ with RV022.

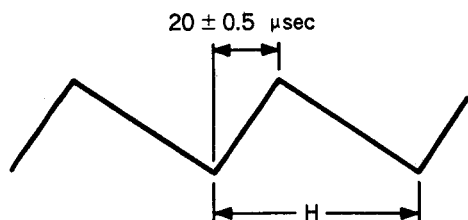


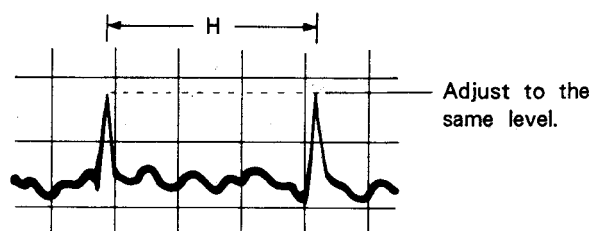
Fig. 8-27. JOG PLL adjustment

9. Shift adjustment (VI-50 board)

Mode	Playback
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Pin ② of IC007
Measuring Instrument	Oscilloscope
Adjusting Element	RV025
Specified Value	Same level of peaks

Adjusting method :

- 1) Adjust the signal level (per 1H) with RV025.



Note : Signal sometimes appears on the lower side depending on the trigger condition.

Fig. 8-28. Shift adjustment

10. JOG exchange chroma level adjustment (VI-50 board)

Mode	PB · PAUSE (STILL)
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Pin ⑧ of IC007
Measuring Instrument	Oscilloscope
Adjusting Element	RV021
Specified Value	Minimum fluctuation

Adjusting method :

- 1) Adjust RV021 so that the fluctuation of level is minimum.

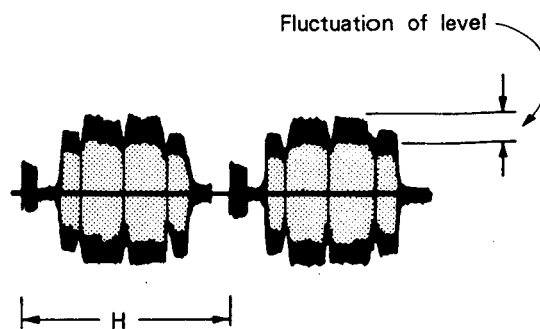


Fig. 8-29. JOG EXCH. C. level adjustment

8-4-3. SECAM Chroma System Adjustment

1. Bell filter adjustment (VC-52 board)

Mode	E-E
Signal	SECAM color bar
Measurement Point	Pin ③ of CN802
Measuring Instrument	Oscilloscope
Adjusting Element	LV804
Specified Value	Flat waveform

Adjusting method :

- 1) Adjust LV804 until the waveform is flat.

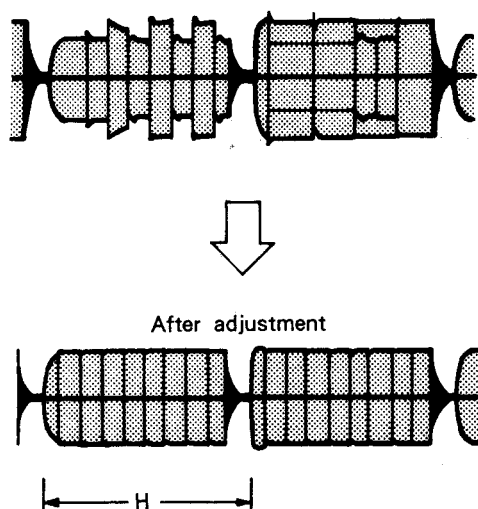


Fig. 8-30. Bell filter adjustment

2. Counter bell filter adjustment (VC-52 board)

Mode	Self-recording and playback
Signal	SECAM color bar
Measurement Point	Adjust while observing the
Measuring Instrument	SECAM monitor TV screen.
Adjusting Element	LV801
Specified Value	Cleanest border between the red and blue areas

Adjusting method :

- 1) Record SECAM color bar signals.
- 2) Playback the recorded signals.
- 3) While observing the monitor TV screen, adjust LV801 until the border between the red and blue areas is at its cleanest (minimum beats).

8-4-4. JOG System Adjustment

1. PAL/SECAM JOG level adjustment (VI-50 board)

Mode	PB · PAUSE
Signal	PAL alignment tape (KR5-2H) color bar
Measurement Point	Emitter of Q506
Measuring Instrument	Oscilloscope
Adjusting Element	RV502
Specified Value	Level difference is 0 ± 25 mVp-p during playback and PB · PAUSE.

Adjusting method :

- 1) Play back the color bar and measure the signal level.
- 2) Set the unit into the PB · PAUSE mode.
- 3) Adjust RV502 so that the level difference measured in 1) is 0 ± 25 mVp-p.

2. NTSC JOG AFC adjustment (VI-50 board)

Mode	PB · PAUSE
Signal	NTSC alignment tape (KR5-1V) β II or β III color bar
Measurement Point	Pin ③ of IC502
Measuring Instrument	Oscilloscope
Adjusting Element	RV501
Specified Value	31.8 ± 0.1 kHz

Connection :

- 1) Connect Pins ⑥ and ⑭ of IC502 with a jumper wire.

Adjusting method :

- 1) Adjust to 31.8 ± 0.1 kHz with RV501.

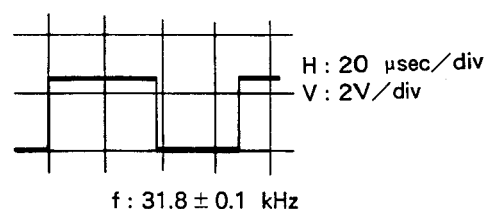


Fig. 8-31. NTSC JOG AFC adjustment

8-5. AUDIO SYSTEM ADJUSTMENT (SA-28 BOARD)

Be sure that the tapes to be used are dynamicron (normal type L-125 to L-500).

[Measuring instruments connection diagram]

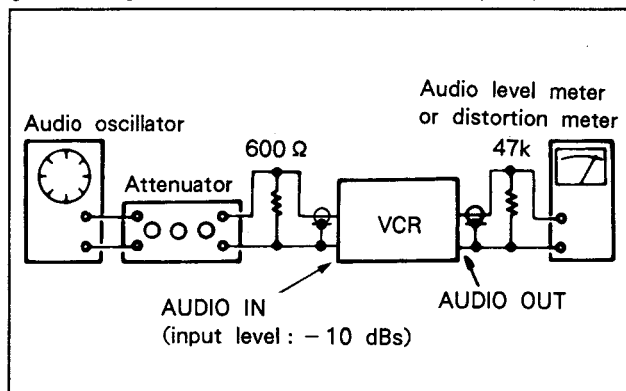


Fig. 8-32.

[Adjusting order]

1. ACE head adjustment
.....See mechanism adjustments
2. Playback frequency characteristics check
3. Playback output level check
4. E-E output level check
5. Bias oscillation frequency check
6. Bias trap check
7. Recording bias adjustment
8. Recording level check
9. Overall frequency characteristics check
10. Overall S/N check
11. Overall distortion check

8-5-1. ACE Head Adjustment

See the "Mechanism adjustments".

8-5-2. Playback Frequency Characteristics Check

Mode	Playback
Signal	PAL alignment tape (KR5-2H) 333 Hz (monoscope) and 5 kHz (RF sweep) sections
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	The 5 kHz level is -2 ± 3 dB against 333 Hz.

Confirmation method :

- 1) Play back the 333 Hz and 5 kHz sections and be sure to confirm that the level of the 5 kHz is -2 ± 3 dB against that of 333 Hz.

8-5-3. Playback Output Level Check

Mode	Playback
Signal	PAL alignment tape (KR5-2H) 333 Hz (monoscope) section
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	-30 ± 2.5 dBs

Confirmation method :

- 1) Be sure to set the playback output level to -30 ± 2.5 dBs.

8-5-4. E-E Output Level Check

Mode	E-E
Signal	333 Hz, -10 dBs
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	-10 ± 2 dBs

Confirmation method :

- 1) Input 333 Hz, -10 dBs signal to the AUDIO IN terminal.
- 2) Be sure to confirm that the audio output level is -10 ± 2 dBs.

8-5-5. Bias Oscillation Frequency Check

Mode	Recording
Signal	Non-signal (Note)
Measurement Point	Base of Q901
Measuring Instrument	Frequency counter
Specified Value	65 ± 5 kHz

Note : Turn the audio oscillator OFF.

Confirmation method :

- 1) Be sure to confirm that the oscillation frequency is 65 ± 5 kHz.

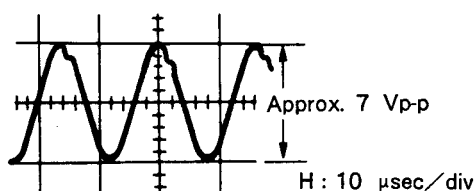


Fig. 8-33. Bias oscillation frequency check

8-5-6. Bias Trap Check (SA-28 Board)

Mode	Recording
Signal	Non-signal (Note)
Measurement Point	Pin ② of IC901
Measuring Instrument	Oscilloscope
Specified Value	Less than 0.4 Vp-p

Note : Turn the audio oscillator OFF.

Confirmation method :

- 1) Be sure that the recording bias leakage level is less than 0.4 Vp-p.

8-5-7. Recording Bias Adjustment (SA-28 Board)

Mode	Recording and playback
Signal	1. 333 Hz (AUDIO OUT level : - 30 dBs) 2. 7 kHz (AUDIO OUT level : - 30 dBs)
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Adjusting Element	RV901
Specified Value	The 7 kHz level is 0 ± 1 dBs against 333 Hz

- Be sure the playback frequency characteristics adjustment has been completed.

Adjusting method :

- 1) Connect jumper between Pin ② of IC901 and GND and turn the AGC operation OFF.
- 2) Supply 333 Hz signal to the AUDIO IN terminal.
- 3) Connect a level meter to the AUDIO OUT terminal.
- 4) Adjust the attenuator so that the indication of the level meter becomes - 30 dBs.
- 5) Perform recording.
- 6) Set the audio input signal to 7 kHz and perform recording.
- 7) Play back the recorded section and measure the respective output levels of 333 Hz and 7 kHz.
- 8) Confirm that the playback output level of 7 kHz is 0 ± 1 dBs against the playback level of 333 Hz.
In the event it is out of the specification, adjust with RV901 and repeat items 2) to 8).
- 9) Remove the jumper.

8-5-8. Recording Level Check

Mode	Recording and playback
Signal	333 Hz, - 10 dBs
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	$- 10 \pm 2.5$ dBs

Confirmation method :

- 1) Supply 333 Hz, - 10 dBs signal to the AUDIO IN terminal.
- 2) Perform recording.
- 3) Play back the recorded section and confirm that the AUDIO OUT level is $- 10 \pm 2.5$ dBs.

8-5-9. Overall Frequency Characteristics Check

Mode	Recording and playback
Signal	1. 333 Hz 2. 50 Hz 3. 100 Hz 4. 7 kHz 5. 10 kHz AUDIO OUT level : - 30 dBs
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	See Fig. 8-34.

Confirmation method :

- 1) Connect jumper between Pin ② of IC901 and GND and turn the AGC operation OFF.
- 2) Supply 333 Hz signal to the AUDIO IN terminal.
- 3) Set to the E-E mode and adjust the attenuator so that the reading of the level meter of the AUDIO OUT becomes - 30 dBs.
- 4) Perform recording.
- 5) Alter the frequency to 50 Hz, 100 Hz, 7 kHz, and 10 kHz, and repeat items 3) and 4).
- 6) Play back the recorded section and confirm that the respective output levels are within the specification. (See Fig. 8-34.)
- 7) Remove the jumper.

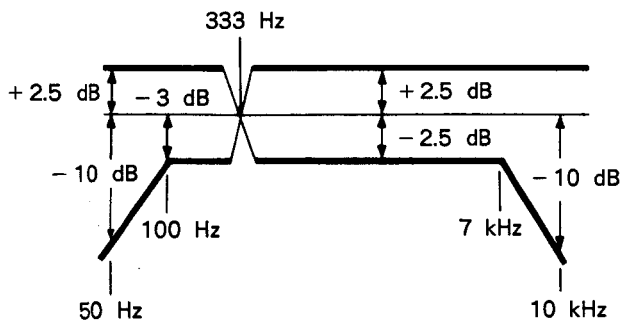


Fig. 8-34. Overall frequency characteristic

8-5-10. Overall S/N Check

Mode	Recording and playback
Signal	1. 333 Hz, - 10 dBs 2. Non-signal
Measurement Point	AUDIO OUT
Measuring Instrument	Audio level meter
Specified Value	More than 38 dB

Confirmation method :

- 1) Supply 333 Hz, - 10 dBs signal to the AUDIO IN terminal.
- 2) Perform recording.
- 3) By maintaining the recording mode as is, turn OFF the audio oscillator.
- 4) Play back the recorded section and confirm that the level difference between the 333 Hz section and the non-signal section (The section immediately after the 333 Hz signal) is over 38 dB.

8-5-11. Overall Distortion Check

Mode	Recording and playback
Signal	333 Hz, - 10 dBs
Measurement Point	AUDIO OUT
Measuring Instrument	Distortion meter
Specified Value	Less than 4 %

Confirmation method :

- 1) Supply 333 Hz, - 10 dBs signal to the AUDIO IN terminal.
- 2) Perform recording.
- 3) Play back the recorded section and confirm that the distortion is less than 4%.

8-6. TUNER SYSTEM ADJUSTMENT (TU-95 BOARD)

8-6-1. RF AGC Adjustment (TU-95 Board)

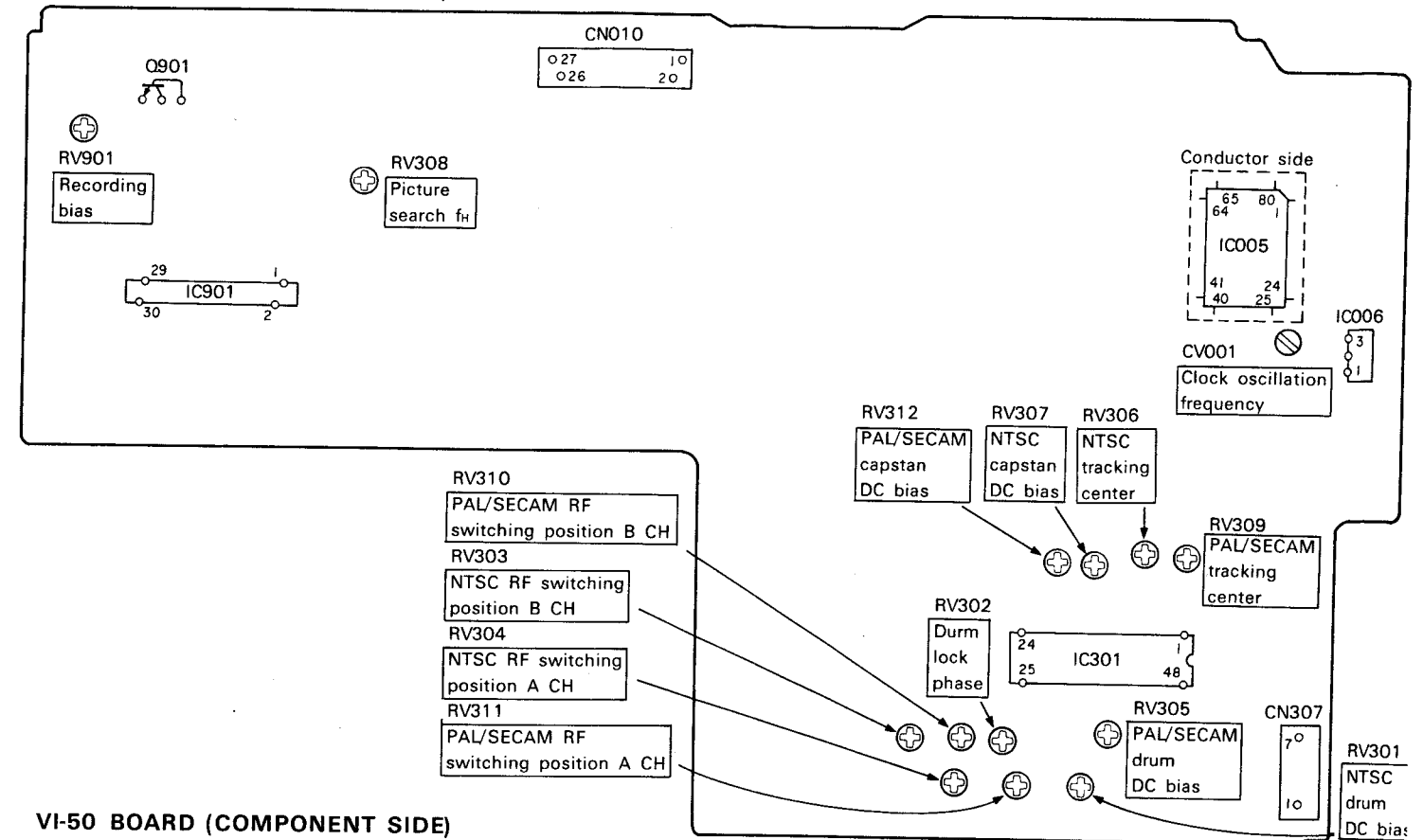
Mode	E-E
Signal	TV broadcast signals
Measurement Point	Confirm with monitor TV screen
Measuring Instrument	
Adjusting Element	RV701
Specified Value	No beat, picture disturbance or snow noise

Adjusting method :

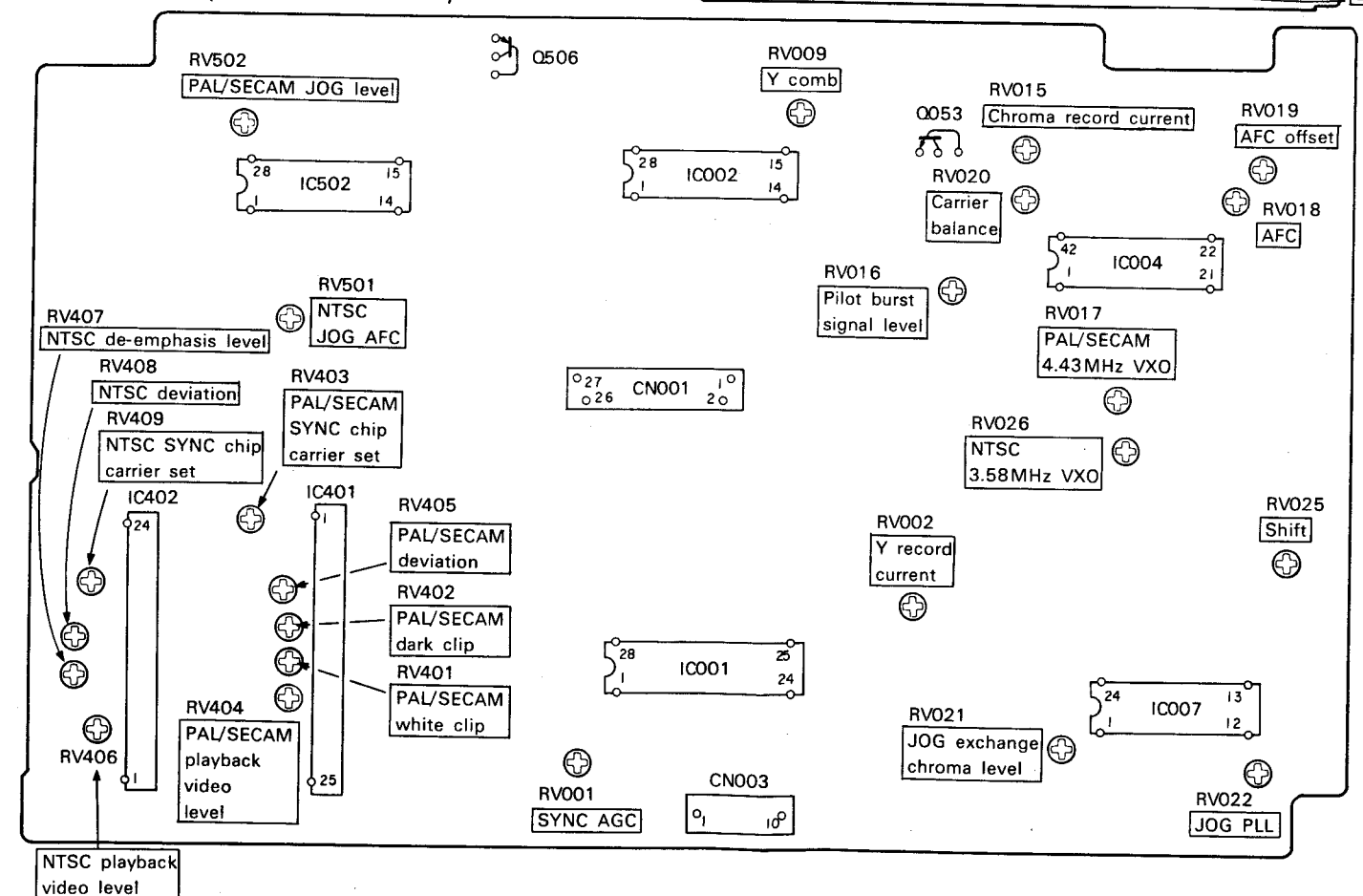
- 1) Adjust the monitor TV for best contrast and receive a broadcast signal.
- 2) Adjust RV701 so that snow noise is visible.
- 3) Turn RV701 in the opposite direction to that in (2) and set at the point where snow noise disappears.
- 4) Receive each channel and confirm that there is no beat, picture disturbance or snow noise.

ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

SA-28 BOARD (COMPONENT SIDE)

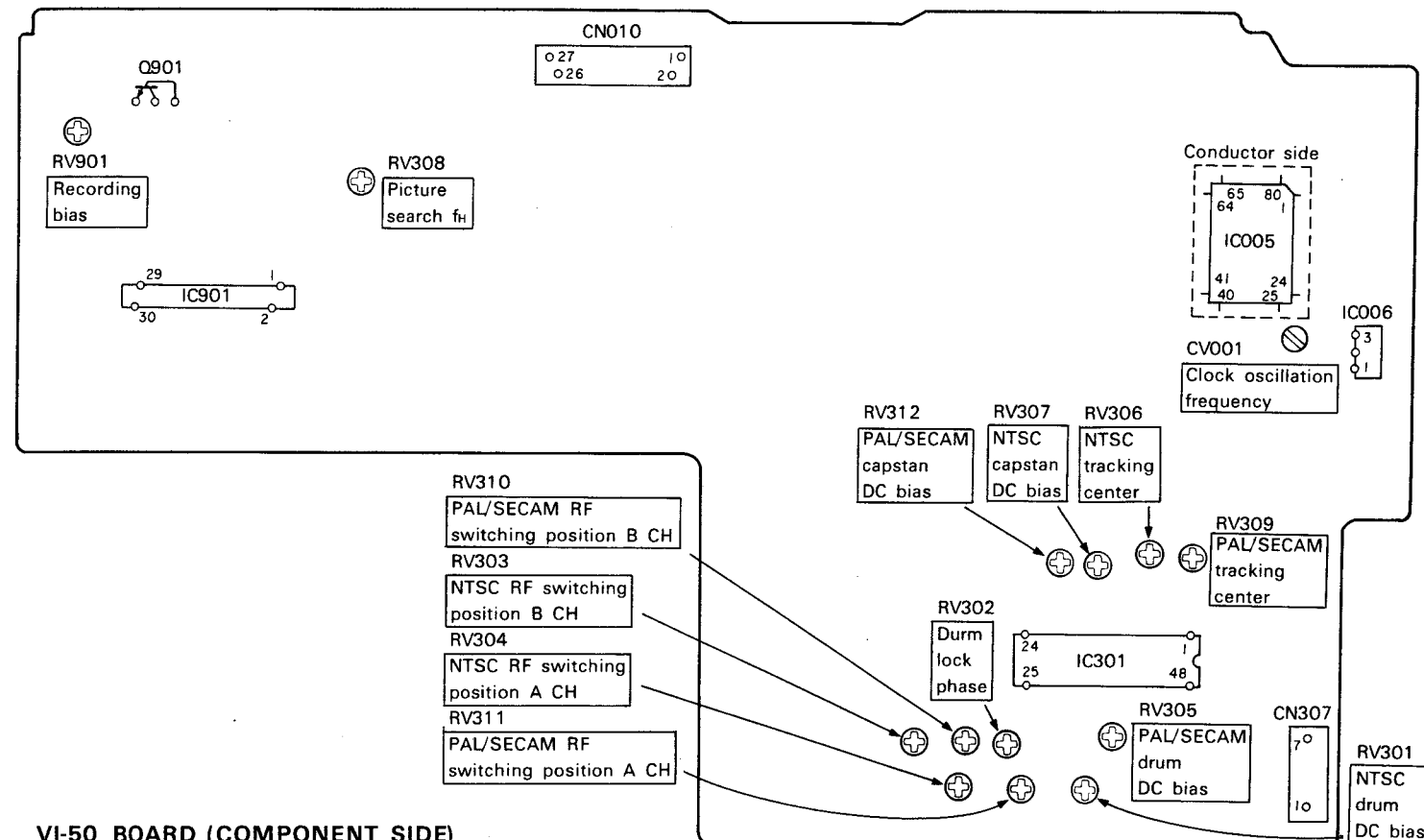


VI-50 BOARD (COMPONENT SIDE)

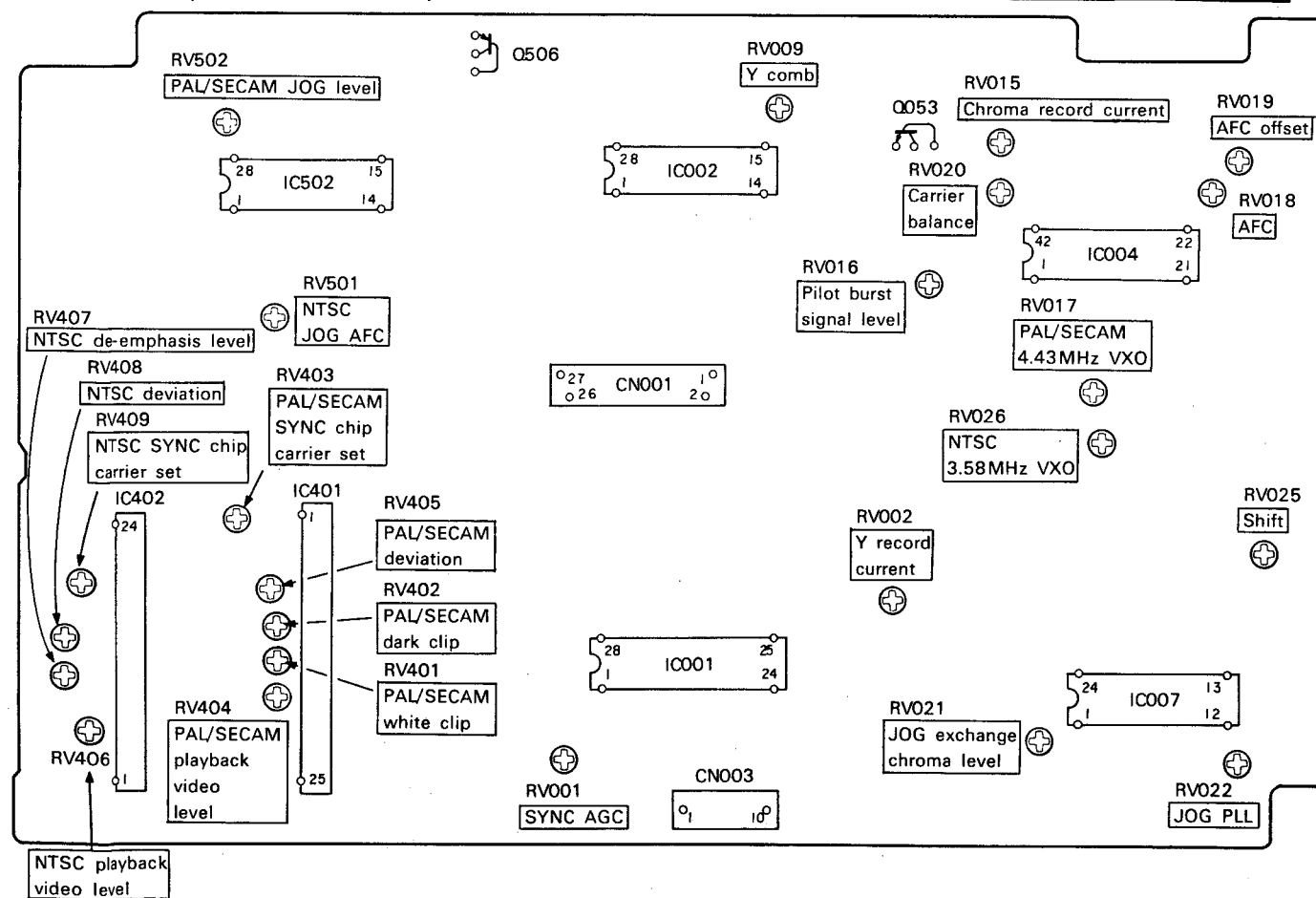


ARRANGEMENT DIAGRAM FOR ADJUSTMENT PARTS

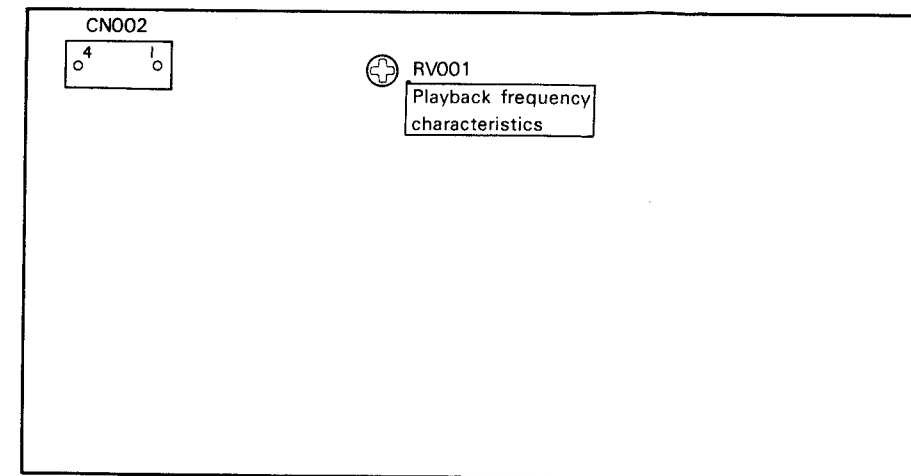
SA-28 BOARD (COMPONENT SIDE)



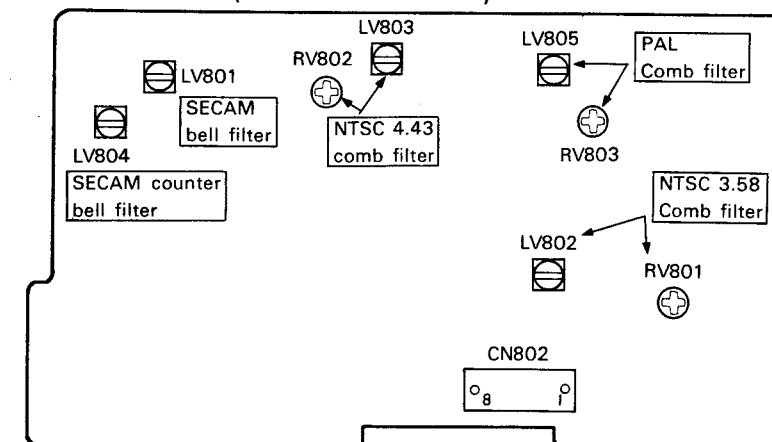
VI-50 BOARD (COMPONENT SIDE)



RP-70 BOARD (COMPONENT SIDE)



VC-52 BOARD (COMPONENT SIDE)



TU-95 BOARD (COMPONENT SIDE)

